AN ANDRAGOGICAL FRAMEWORK FOR BENCHMARKING ELEARNING AT TECHNIKON FREE STATE (TFS)

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Elearning has shown enormous growth worldwide during the last decade. Elearning initiatives expanded rapidly, as technological improvement and a greater demand from learners arose as a result of the need for life-long learning and changing demands in the world of work. Many higher education institutions use elearning as an alternative for or additional to conventional face-to-face education. The changing needs of learners, and especially adults, forced institutions to upgrade their traditional courses and increasingly make use of technologically enhanced courses.

The research problem encompasses the fact that the growth of elearning poses many problems to higher education institutions, as the delivery by means of technology is complex. Many higher learning institutions were not prepared adequately to deliver education by using elearning and did not have the required systems in place. The greatest concern was that staff was not familiar with the technology or its use and that the particular demands of staff arrangements to engage in elearning programs were not taken into account. It appears that institutions did not plan or have systems and guidelines in place to implement programs at a distance using elearning technology. Another concern was that most of the programs held traditional approaches and has not been adapted to suit the particular characteristics and needs of distance education by taking the planning, development and review of such programs into consideration. As part of ongoing research at the Technikon Free State, appropriate research had to be undertaken. Consequently the following research question emanated from the research problem:

Within the context of higher education in South Africa, what framework underpinned by andragogy, national education policies and elearning theory, will benchmark and support the implementation of elearning at Technikon Free State (TFS)?

The aim of the study is to provide a framework for benchmarking elearning at TFS. In general, a benchmark is an institutional approach that contributes to ensuring quality in technology, that mediates distance education, or for measuring any type of education for the purposes of quality assurance. The research method used to conduct this study was primarily that of a case study.

As part of the case study to investigate the research problem, I employed both qualitative and quantitative research approaches. As part of the quantitative approach and to determine the current state of elearning at Technikon Free State, a

questionnaire was used. The q ained all the benchmarks that were derived from literature, namely, the elearning principles, andragogical principles and the requirements as set by the higher education policy. Provision was also made to add remarks to the various sections of the questionnaire. As part of the qualitative approach interviews were conducted, documents were studied, audio-visual materials were implemented and the observational method applied during institutional visits.

Set against this background and Technikon Free State being a higher education institution, the didactical field of the andragogy was explored and its assumptions served as basis of the proposed framework to benchmark elearning. In addition, the principles of national and international accredited providers of elearning were used in a questionnaire to determine the current state of elearning at Technikon Free State, but also to provide information on how to improve and benchmark elearning in the contextualised setting. Furthermore, the aforementioned benchmarks also fall within the parameters as required by law and within the requirements of the National Education Policy.

Andragogy, which is the art and science to teach adults, provides an appropriate approach to develop guidelines for adult education. I propose an andragogical approach to elearning and distance education as an appropriate framework for developing elearning. The National Department for Education provided policies that contain guidelines that can impact on elearning and the delivery of distance education. These policies were implemented to level the playing fields of the past as well as to equip our educational dispensation to be globally competitive. Within this context of higher education and with andragogy as basis, this study aims to benchmark elearning at Technikon Free State. Scientific benchmarks that were found in my research are based on andragogical principles; the requirements pertaining to the new plan for higher education; as well as elearning as accepted nationally and internationally by accredited academical institutions. For the purpose of my research, I investigated elearning and distance education at the Technikon Free State as implemented since 2001 and up to 2003.

The research conducted showed that strategies are needed to empower lecturers and learners alike to engage in elearning, as it has become a part of new educational strategies and technology. As part of this empowerment I developed a framework that can be used by Technikon Free State. The framework contains essential principles to direct management and lecturers alike to implement elearning.

The research showed certain sh[illegible] most important one pertains to staff that are not adequately trained in elearning technologies and the lack of staff available at Technikon Free State to ensure that the institution will indeed become fully operational in delivering elearning. It is therefore in the interest of the institution to embrace elearning fully, seeing that increasing numbers of learners will demand elearning accessibility. Many learners need to be able to use computers in education. Elearning can be used by learners, not only in distance education, but also by learners on campus. The ideal is that each faculty, as part of the learners' programs, incorporates computer literacy and provides computer facilities to all its learners. A huge shortage exists in computers as the library at CUT only has 250 computers to serve around 8000 learners.

Lecturers should be assisted by support structures at faculties, with, for example, computer technicians, tutors, instructional designers and assistants to fully implement elearning. The vision and mission of the institution must serve as guide for management and staff. The change in being The Central University of Technology Free State (CUT)(a change that took place in April 2004) will thus require changes by the institution to adapt to the latest technology. Subsequently for the purposes of this research, all references to TFS must be interpreted as CUT hereafter.

Central University of Technology, Free State

DECLARATION OF INDEPENDENT WORK

I, JOHAN BEZUIDENHOUT, do hereby declare that this research project submitted to Technikon Free State for the degree DOCTOR TECHNOLOGIAE: EDUCATION in the School: Teacher Training in the Faculty of Management Sciences at Technikon Free State, is my own independent work that has not been submitted before to any institution by myself or any other person in fulfilment of the requirements for the attainment of any qualification.

SIGNATURE OF LEARNER

20 May 2004
DATE

Statement 1

This thesis is the result of my own investigation, except where otherwise stated. Other sources are acknowledged in the chapters as references. References are appended.

SIGNATURE OF LEARNER

20 May 2004
DATE

To my wife Trysie, my sons Rainier and Ruan for their support and understanding during the past three years it has taken to complete the research and thesis. To my loving family (sisters and brothers in law) who always supported me in whatever venture I intrude upon. In the world of change, education and the use of knowledge has become ever more prevalent. In my humble opinion I believe that if people are educated they would abstain from crime and seek better opportunities to become citizens with dignity and pride.

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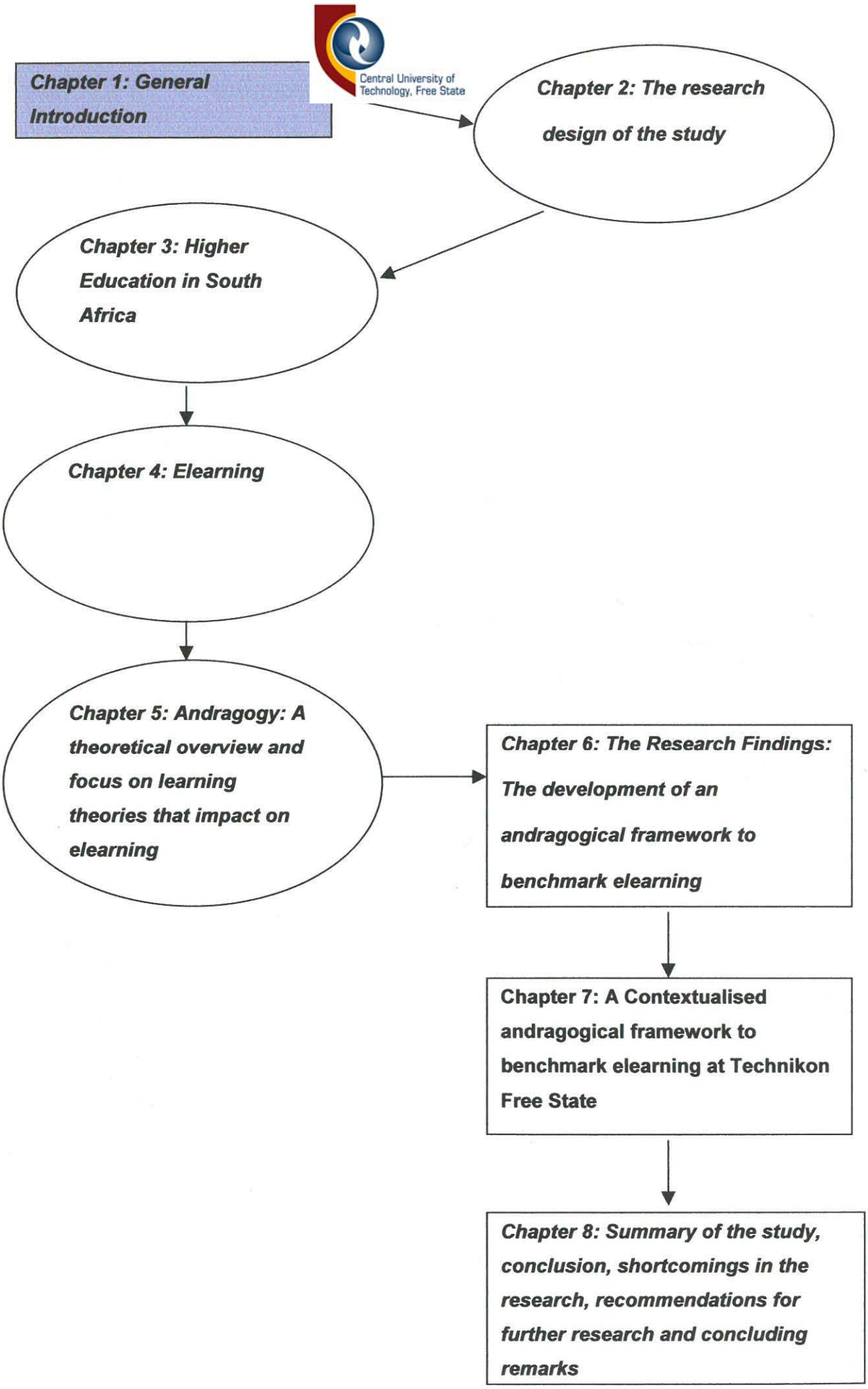
CHAPTER ONE



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GENERAL INTRODUCTION

1.1 INTRODUCTION AND ORIENTATION OF THE STUDY

"Most distance education is concerned with the education of adults and it seems fairly obvious that our research plans should be informed by the theories and research about learning in adulthood, adult development, program planning, instruction and evaluation in adult education" (Moore, 1984:44).

Distance education – or distance learning – in the form of correspondence courses has been part of education for a number of years. These two terms, distance education and distance learning, have been applied interchangeably to a great variety of programmes, providers, audiences and media, but the central idea in this type of education is that the learner and teacher are separated in space and/or time (Sherry, 1996:1). Since the introduction of the computer, distance-learning programmes have become more prevalent in the last decade. With the development of the World Wide Web (WWW) and the Internet a new technology in education, namely electronic learning (elearning) has been introduced.

Elearning refers to any learning that utilises a Local Area Network (LAN), Wide Area Network (WAN) or the Internet for interaction, delivery and facilitation of learning. Elearning includes distributed learning, distance learning (other than pure correspondence), Computer Based Teaching (CBT) delivery, network and Web Based Teaching (WBT). This type of learning can be synchronous (in real time as in video-conferencing), asynchronous (or delayed as in Computer Disk (CD Rom), instructor led, computer based, or a combination of these (eLearners, 2000:1).

Elearning has added a new dimension to the delivery of education over a distance, because of the accessibility of information and new methods available for learning. However, this new phenomenon also causes problems since few traditional educationists have adjusted to delivery of education by using a computer. As a result of the multitude of methods available, a paradigm shift was necessary in order to change and adapt traditional educational methods (that were more teacher centred) to fit the technology. This change in itself created numerous problems for educationists, as they had to design and develop new approaches in distance education, in particular

with regard to elearning. As [online]) explains: "The choice of medium in itself does not guarantee effectiveness, but the way in which you do it".

Technology has brought a significant change in higher education institutions. The Internet will continue to play a significant role in learning, and specifically in higher education" (compare Bates, 2000:16; Rosenberg, 2001:25). Elearning was introduced into South Africa in the 1980s by universities and technikons (Lippert, 1993:5). The University of South Africa (UNISA) – the largest correspondence university – had to adapt to new technology as it began converting its existing correspondence courses into elearning. Technikon Free State (TFS) also followed the various technological developments and introduced elearning as part of distance education delivery in 2000. As with most educational institutions the change occurred suddenly and many educators could not adjust to the various facets of elearning. Instead they replicated their current course material to fit an electronic environment. A designer Rodger Shank (1977:100) comments that educationists merely "replicated the existing system".

TFS initially established the Bureau for Distance Education and Telematic Learning. The management of TFS realised that due to new technology a paradigm shift was needed, and hence, in June 2001, the Bureau was renamed the Centre for Distance Education and Telematic Learning (De Beer & Van Rensburg, 2000:2). However, since 'tele' refers to distance and 'matic' by means of, a contradiction in terms was evident. After careful consultation, in August 2002 the Centre was renamed the Centre for Distance and Electronic Education.

A new approach to assist learners and especially adults in elearning was required. Most learners participating in elearning are adults, as is the case at TFS. Two theoretical constructs, namely andragogy and self-directed learning, are relevant to adult education and proved to be applicable to the delivery of elearning. According to Knowles (1980:43) andragogy literally means "the art and science of helping adults learn". Andragogy is an educational approach to delivering education to adults. Gravett (2000:65) states that andragogy can be used as a synonym for adult education. Self-directed learning as a concept was developed in andragogy and suggests that adults have the need to direct their own learning (Karp, 1996:28).

It is important to realise that many adults prefer to study by using elearning because of the multitude of delivery methods available (NCHE, 2001: [online])(Porter, 1997:10). Andragogy is learner focused and has as supportive base a focus on the needs of the

learner (Shepherd, 2001: [online]) a different way to children (compare Knowles, 1980:43 and Shepherd, 2001: [online]). A new way had to be found to adjust to the adult's way of learning. Andragogy has paved the way for an approach in learning/teaching adults that ensures that elearning is designed and developed according to the highest quality standards compliant to andragogical benchmarks.

In view of worldwide development and the introduction of elearning in South Africa, the aim of this study is to develop a framework for elearning at TFS. In doing so, the requirements of the New Plan for Higher Education in South Africa, andragogical principles and international elearning benchmarks (as established by various internationally accredited academic institutions) are integrated as part of the framework. A benchmark is seen as an indication of what learners need to know and are able to do. Benchmarks describe the array of principles, strategies and guidelines as institutional behaviour that contributes to ensuring quality in elearning (The Institute for Higher Education Policy, 2000:5). Benchmarks must be compliant to both national and international recognition and accreditation and the requirements as set forth in the Higher Education Act (RSA, 1997). It will be argued that a considerable disparity exists within higher education institutions in South Africa (SAQA, 2003: [online]). This disparity is evident in the development and implementation of elearning, due to the interplay of a wide range of factors such as race, culture, belief, socio-economic factors and injustices as caused by the previous "apartheid" system. An indication will be given of how all these factors were evident at TFS.

Against the background of the introduction of and problems associated with elearning at educational institutions worldwide and specifically at TFS in South Africa, a rationale will be presented in the next section that will serve as a framework for the rest of the investigation.

1.2 RATIONALE

South Africa is faced with problems in its delivery of education to the masses of the population. It is clear that many educational institutions cannot cope with the numbers of learners that want to enrol for programmes. According to Taljaard (2003:1) elearning can be used to support education at specifically higher education levels. Michael (2002:3) added that many opportunities exist for higher education institutions to use elearning to eradicate the backlogs in education. A blended (hybrid) form of

delivering education is envisag rning serves learners on and off campus.

Several problems exist with regard to most elearning delivery and/or programmes. In this study I will focus on the main problems that will form the rationale of the study.

The rationale for this study is as follows:

- There is a worldwide need for education, and specifically for higher education in South Africa (NCHE, 2001: [online]).
- Elearning is probably best suited to addressing educational problems, specifically in respect of adult learners by using elearning technologies (Owston, 1997:27).
- Technology will play an increasingly important role in distance education, especially in elearning.
- Elearning mainly involves adult learners. The framework for elearning programmes, in their design and delivery, should undergo a paradigm shift and must be in line with andragogical principles aimed at adult learners – the market for which it caters.
- Elearning should complement methods in the delivery of, and act as alternative to, conventional (distance) education (Dewar, 2001: [online]).
- It is of the utmost importance to keep quality in mind insofar as the design and delivery of programmes as an alternative to conventional education is concerned. The quality of the end result will be determined by assessment in establishing benchmarks that are based on andragogical principles. Quality is based not only on the sophistication of programmes but also on their design according to andragogical benchmarks (Strydom & Van der Westhuizen, 2001:105).
- There are concerns about the efficiency, appropriateness and delivery of current distance education insofar as learners are concerned. In this regard elearning is an ideal way to deliver education as it has the ability to accommodate a variety of media, ensure communication between stakeholders, provide international access (by modem/satellite) and promote the principles of flexible, open and lifelong learning. Elearning also provides research opportunities through access to information (Dewar, 2001: [online]).

Collis (1996:24) regards elearni)f eliminating the distance between learners and the respective educational institutions. The worldwide hunger for knowledge accessibility is minimised. Elearning improves connectivity, provides multifaceted delivery options, improves learning facilitation, extends learning to learners, and provides a multitude of readily available information by means of the WWW and the Internet.

This study focuses on one site, TFS, where elearning has been implemented based on the preceding rationale, as well as relevant educational principles and practices. The study takes place in a contextualised setting as part of a case study.

1.3 THE RESEARCH PROBLEM

Elearning educators at TFS have expressed a need for guidance in the elearning environment, as the adoption of a new technology does not necessarily lead to expert use or bring about significant change in methods or beliefs.

It is my contention that a framework for elearning at TFS will assist all stakeholders to understand the nature of elearning and to use the framework to significantly improve education and make it more readily available. I will argue that even though educators with a theoretical background in education have traditionally based their teaching on constructivist principles, they still need to reflect on their teaching as the elearning approach to delivering education provides them with new challenges. To that end, I will describe the benchmarking of a framework for the development and implementation of elearning, based on requirements for higher education as well as sound andragogical principles. On completion of the study, the proposed framework can possibly be used as a guide for educators or be used as a stand-alone unit for assisting lecturers in the development and implementation of elearning at TFS.

Within this context, the research question to be investigated in this study can be formulated as follows:

What framework, underpinned by andragogy, national education policies and elearning theory, will benchmark and support the implementation of elearning at Technikon Free State?

To answer this question it will be necessary to discuss the higher educational environment in South Africa as it relates to TFS. The aim is to highlight the requirements that institutions in this sector of education need to take into account in the delivery of its programmes. Next a deeper understanding of andragogy or adult education has to be developed in order to provide a sound theoretical framework for elearning where adult learners are involved. Equally important is that the envisaged framework for elearning must comply with educational law and also suit the qualities and tools available in elearning. The higher education context, andragogy and elearning will be investigated in a review of current literature on these topics.

Furthermore, the study will address the practical implications of these issues by means of a case study. Through a questionnaire, interviews, observations and the study of documents I will design and develop a theoretical framework to benchmark elearning at TFS.

1.4 THE AIM OF THE STUDY

To find an answer to the research question this study endeavours to establish a contextualised framework relevant to the implementation of elearning at TFS. This framework will be compliant to elearning benchmarks set nationally and internationally in educational, electronic and computer development organisations. The framework will contain the educational principles as required by the higher education sector and sound andragogical principles, and also as required by good practice in elearning. In order to achieve this aim, the objectives can be stated as follows, that is in order to develop a theoretical framework for benchmarking elearning, a study of current literature will be undertaken:

- To describe the changing higher education environment in South Africa and the implications for elearning
- To provide a theoretical framework derived from andragogical principles
- To investigate the nature and principles of elearning
- To determine the dimensions of the unique form of delivering education at a distance by means of elearning at TFS.

In order to investigate the practical implications of the preceding theoretical framework, a field study will be undertaken to determine the following:

- The current state of elea sed on responses of management, academic and support staff to a questionnaire, as well as on observations, interviews and the study of documents.
- The experiences of learners and lecturers who are currently involved in elearning, by means of a questionnaire, observations, interviews and the study of documents.

The envisaged outcome of this study will culminate into a set of benchmarks for the establishment and development of elearning at TFS in order

- To determine a set of benchmarks for the establishment and development of elearning at TFS, as compliant to andragogical benchmarks, internationally accepted elearning practices and containment within the boundaries of the required laws in South African education. Benchmarks will be established by means of a review of literature, a questionnaire, observations, interviews and the study of documents.

- To finally, suggest an andragogical framework to benchmark elearning at TFS that can be used to establish and develop elearning.

Before the research design to realise these objectives of the study is discussed, it is necessary to provide the paradigmatic perspective that determines the methodology employed by the researcher.

1.5 PARADIGMATIC PERSPECTIVE

The research design of a scientific investigation is determined by factors such as the researcher's personality, environment, skills and attributes that underpin the point of view towards the study. Other aspects to consider are the relationship between the researcher's point of view, the type of research that has to be done and the beneficiaries of the research. These factors are related to the philosophy of science and are based on questions such as "How do we know what we know?" and "What is valid evidence?" The answers to these questions will determine a researcher's understanding, perception and beliefs – which constitute a researcher's paradigmatic perspective or the philosophical viewpoint of the researcher – thus determining a particular approach to research (Beaudin & Quick, 1995:7 and Tashakkori & Teddlie, 2003: [online]).

The research design of a research study will determine greatly which approaches will be used and required to conduct research. Again to validate evidence and using the research question as basis, I decided to use a combination of quantitative and qualitative approaches in this study. Using multiple methods of data collection, an analysis, I felt, would improve validity and triangulation (a sense of seeking convergence of results) (Creswell, 1994:174).

My intention was to investigate elearning at TFS using a small, quantitative design (Lickert Scale) as well as methods for data collection (observations, interviews, document studies) related to a qualitative approach to research. According to Creswell (1994:182) in the reporting of mixed method designs, the researcher can report the findings of the qualitative study separately and would not have to confirm the results from the quantitative study. In this regard the results from both the qualitative and quantitative research will not be discussed separately, but simultaneously (simultaneous triangulation). In so doing, I felt that a more constructive, understandable frame of reference would emerge, making the research easier to interpret.

As my personal history and sociological framework are practically oriented, I conducted this research from a pragmatic point of view. Elearning and its delivery is essentially a practical matter. The point of departure of pragmatism is the question: "What works?" According to Tashakkori and Teddlie (2003: [online]) the philosophy of the pragmatist is defined as: '' *A study which interests and is of value to you, study it in the different ways that you deem appropriate, and use the results in ways that you can bring about positive consequences within your own value system".*

According to Greene and Carnelli (2000) as cited in Tashakkori and Teddlie (2003: [online]) the research problem is of utmost importance and paradigms less important for the pragmatist. As researcher I concur with all the above definitions. I feel strongly about what should work for TFS and also that a significant positive change should be brought about in elearning at TFS.

In this study I see myself as a pragmatist who must develop a theoretical framework that has to work. I also see that positive changes can be brought about for TFS, and all others that will benefit from this research, especially adults. The study is also of interest to me, as I can develop something to benefit education in general that will hopefully empower humankind. It is particularly important for me, as educator, to bring

about change in a society who h ɔm lack of educational opportunities and possibilities stemming from a denial of quality education.

Pragmatism is a philosophy born on American soil. John Dewey was one of a few American intellectuals who helped to create pragmatism. Peirce, James and Mead supported Dewey in the development of pragmatism. Pragmatists embrace the idea that this version of the scientific method provided an accurate roadmap for the search for truth. The truth will persist and remain. The truth will assist in forging satisfactory relations with other parts of our experience as humans. Pragmatists base the truth on previous truth and see the search for new truth as an ongoing process (Ryan, 1995:375). Truth is seen as ideas that can be assimilated, validated, corroborated and verified. As pragmatist I therefore used multiple methods in data collection and followed a mixed model method in research design to find "truth."

In addition, Dewey also saw education as a shared experience amongst educators and learning with others as experiencing with others. Through this experiencing one learns the most important lessons in life. This principle is closely related to andragogy (Rescher, 1997:58). The following statement is a Dewey truism: "Education is a mode of life, of action".

James (as cited in Towns, 1997:1) defines pragmatism as a method that "tries to interpret each notion by tracing its respective practical consequences". Since pragmatism focuses on what is true, it is ideally suited to problem solving through invention, science and democratic means. In elearning such qualities are necessary to ensure good practice and in itself provides answers to problems. Pragmatists would like to find meaning and would like to verify what has been found. At TFS the results of this research would indeed make meaning and would be verified by using multiple sources of data corroborating the respective findings. Reliability and validity would be maintained in the "truth".

Equally important is that theories (in this case, andragogy) must become instruments and must be practically applied to test whether they work. Again I, as pragmatist, believe in facts and concreteness and I observe the truth as it is found in this particular case at TFS.

In conclusion, Dewey as cited in Towns (1997:19), and (Beaudin & Quick, 1995:23) state that an educational aim must be based on intrinsic motivation and needs. Adults

have a need for competence an on. Elearning and andragogy foster such needs that are strengthened by primary rewards such as experiences of efficacy and autonomy. Pragmatism assists learners to seek situations that interest them and ways to use their creativity. As researcher, in this investigation I am seeking that which works in a creative manner in the use of elearning at TFS.

Apart from the scientific paradigm of a researcher, in my case pragmatism, there are ethical considerations to be taken into account when doing research where human beings are the respondents.

1.6 ETHICAL ASPECTS IN RESEARCH

Accountability, according to Babbie and Mouton (2001:527) is the most important principle in research. Scientists are always accountable for research conducted and should do research in a socially responsive and accountable manner. "Accountability in science is manifested in the following ways:

- A rejection of secret research
- An obligation to avail research for free and open discussion and dissemination
- And a responsibility to ensure that the sponsors' agreements of the research conducted are met in good faith."

De Vos, Strydom, Fouché, Poggenpoel and Schurink (1998:24) see ethical guidelines as the researcher's basis on which he can evaluate and measure the standards of his research and conduct. Researchers are ethically compelled to change the nature of their research if it means harm, injury or exposure to participants in the study.

The following principles need to be adhered to in any research conducted (Babbie & Mouton, 2001:520). I, as researcher, familiarised myself with all the ethical aspects before commencing with my research. The following principles were adhered to:

- **Informed consent and voluntary participation**. The necessary permission was obtained from TFS through the Faculty of Human Sciences (appendices one and two). All relevant personnel and learners that participated in the study did so voluntarily.
- **Anonymity and Confidentiality**. All parties were duly informed at all times of the researcher's intent and, if they were willing, they consented to be quoted, on

condition of confidentiality completing the questionnaires did so voluntarily and were promised anonymity and confidentiality by the researcher (see appendix three, questionnaire). I gathered information through a questionnaire as part of the quantitative approach. Although it was possible to see who completed the questionnaires, as it was done via email and personal delivery, I ensured that the respondents' anonymity and confidentiality were upheld. I issued respondents with a unique number that was only known to me. I also then summarised all the responses in the form of a table (see appendix four and five). Nowhere in any of the research documents or appendices is it possible to determine identity, therefore ensuring anonymity. Respondents who were prepared to expose themselves in interviews or documents or observations did so voluntarily and with informed consent. Where respondents' names were omitted from quoted comments, this was done to ensure anonymity and confidentiality of the respective respondents. I promised anonymity to all respondents and reassured them that all documentation relating them to the study would be destroyed after six months of achieving the qualification. Since many respondents had to reveal themselves, I experienced a low number of returned questionnaires of only 30.1%.

- **Harm to participants**. Harm does not always refer to physical harm, but can include fear of exposure, threats, defamation of character and deviant behaviour. The researcher guarded against this by ensuring that respondents were treated with respect, participated voluntarily and gave their informed consent at all times. Confidentiality was also promised to all participants in the study.
- **Deceiving subjects**. All subjects were fully aware and informed at all times of what the researcher was investigating and for whom. Again respondents participated voluntarily.
- **Analysis and reporting**. I tried to maintain objectivity and integrity in the conduct of the research by:

- Adhering to the highest possible standards of scientific rigour
- Acknowledging any shortcomings in the study
- Reporting fully on the findings and ensuring validity through methodological correctness
- Ensuring the just and accurate presentation of data
- Being prepared to disclose all methods and techniques in analysis.

The ethical requirements set Afrikaans University's Faculty of Education and Nursing (RAU, 2003:1) have also been taken into account. These requirements refer to the following aspects:

- The participant as a person: TFS staff participated freely in research.
- Human rights: The researcher respected the basic human rights of TFS staff as individuals, groups or community.
- The ethic of justice, fairness and objectivity: The dignity of TFS staff was protected as they were not exposed to intentions or motives not directly attached to the research project, its methodology and objectives.
- Competence: The researcher was at all times professional in his approach and acted responsibly by maintaining professional standards.
- Integrity: The researcher realised his limitations, competence, belief systems, values and needs by being honest and fair.

The researcher can therefore state with honesty that all ethical principles were as far as possible adhered to during the research at TFS. Having explicated the theoretical and ethical underpinnings of this study, an overview of the research process will now be given.

1.7 THE RESEARCH DESIGN

The following paragraphs contain an outline of the research design of this investigation. A more comprehensive description of the research design is found in chapter six of this dissertation. In this section, the step-by-step planning of the research project will be presented (Babbie & Mouton, 2001:72). This overview includes a discussion of the creation of a theoretical framework based on relevant literature as first objective of the study, as well as an exposition of the empirical research involving qualitative and quantitative research methods. Lastly, the trustworthiness and envisaged research contribution of this study will be discussed.

1.7.1 Review of literature and creation of the theoretical framework

A literature study is undertaken, initially to explain difficult terminology, new concepts and ideas and to supply a theoretical basis for the establishment and benchmarking of the proposed andragogical framework for elearning. The researcher, who is an educationist, had to acquire a thorough understanding of elearning, distance education

and higher education before he a field study at TFS. He was also unfamiliar with TFS and had to familiarise himself with staff, learners and support personnel in order to be able to conduct the research.

The objective of the literature study is to create a theoretical framework for the investigation of elearning at a South African institution. Firstly, the higher education environment will be explored based on relevant sources including policy documents. The fields of elearning and distance education will then be investigated with specific focus on the dimension of programmes in these domains and in elearning. The literature study will embrace how elearning must be designed against certain andragogical benchmarks. To this end, the literature on andragogy will be studied in order to derive these benchmarks for measuring the quality of elearning. Word analyses, text analyses, descriptions and characterisations of relevant topics in the literature will be undertaken. A framework ideally suited to TFS will emerge from this.

Control in terms of validity of the literature study is exercised by means of:

- Exposure to criticism by supervisor and co-supervisor;
- Exposure to criticism during doctoral committee meetings, seminars and other meetings with experts;
- Exposure to current lecturers and learners who were previously and are currently involved in elearning at TFS;
- Corrective measures after criticism;
- Final control of the study by external examiners.

1.7.2 Empirical research approach

The empirical component of this study is to a large extent a qualitative study that incorporates a few quantitative components. The main research output is a case study of a single, bounded system using qualitative data collection techniques. The subsequent sections contain an overview of the empirical investigation focusing on the participants, quantitative and qualitative methods, as well as trustworthiness and research contribution of the study. A more comprehensive discussion of the empirical research is offered in chapter two.

1.7.3 Participants in the stud

The respondents of this research comprised management, academic staff and support staff at TFS. All these participants were selected because they had knowledge of elearning, were busy with or involved in elearning and/or had presented courses in elearning before. Some participants were also chosen for being creators of policies that influenced elearning at TFS.

1.7.4 Data collection

I employed quantitative and qualitative data collection methods as part of a mixed model

Data were collected using a variety of instruments as described below:

Two sets of quantitative data were used:

- A questionnaire was compiled based on andragogical benchmarks as basis, benchmarks based on the changes in higher education in South Africa, and national and internationally accredited elearning benchmarks. The questionnaire determined the *importance* of elearning at TFS.
- Secondly, the questionnaire compiled on the above-mentioned benchmarks also measured the *presence* of the same benchmarks at TFS.

The study makes use of case study techniques for qualitative data collection:

- **Interviews:** Data were collected in an initial round of *open interviews* with all stakeholders and through concurrent analysis, with the idea of further rounds of interviews on completion of each new semester to further investigate emerging themes. Initial sampling was purposive to achieve a balance of gender and a variety of subject areas for selection of the participants. *Key informant interviews* were held with individuals who I believed possessed special knowledge, status and communicative skills, and who were willing to share their knowledge and skills (Babbie & Mouton, 2001:291).

- **Documents:** Various documents were studied which had been obtained from the staff responsible for distance and electronic education. The researcher also

studied many documents el, containing their own plans to implement elearning at TFS. This provided me with supportive clues as to the thinking of staff involved (Babbie & Mouton, 2001:300).

- **Observations:** Additional data were collected using a reflective journal based on events, comments by the participants, and my own thoughts and feelings during the research process based on the observations I made (Babbie & Mouton, 2001:295).

- **Analysis of visits:** During the initial visits as part of the research process, relevant information was gathered from learners, lecturers and staff involved with elearning. Interviews were conducted with learners and observations were made to identify aspects from the learners' points of view that could impact upon their understanding of electronic education, to assist in the development of the proposed framework (Babbie & Mouton, 2001:299).

The data will then be used to design a framework for the establishment of elearning at TFS according to andragogical benchmarks, acceptable elearning practices and the changes in South Africa's higher educational system. Data collected as part of the findings of the quantitative and qualitative investigation will be used to benchmark the framework for elearning at TFS.

A brief description of the methods of data analysis, described in more detail in chapter seven, is given below.

1.7.5 Data analysis

Miles & Huberman (1984:54) describe the dilemma that faces researchers when confronted with a mountain of unanalysed data. Words have multiple meanings and it is not always possible to elicit meaning from data by simply converting it to a computable format like numbers (Babbie & Mouton, 2001:413). According to Creswell (1994:124) there is no "right way" of doing data analysis. This section focuses on the analysis of data gathered using qualitative techniques in this study.

Creswell (1994:153) is of the opinion that the researcher must be comfortable with the development of categories and with making comparisons and drawing contrasts during the process of data analysis. De Vos *et.al.* (1998:334) also advocate the process of

breaking down the data into units hen categorising the units. Merriam (1998:192) summarises this process as the development of themes, categories and other taxonomic classes that interpret the meaning of the data. When categories and their properties are reduced, refined and linked together by tentative hypotheses, the analysis moves towards the development of a theory to explain the meaning of the data.

In this study the process of open coding, as proposed by Strauss and Corbin (1990:25), will be implemented. Open coding refers to the creation of categories pertaining to certain segments of text. Coding of data will be done line by line in order to identify all possible categories and create a larger basis for theoretical sampling. Only open-ended data can be analysed in this way (Babbie & Mouton, 2001:500).

1.7.6 The trustworthiness of the study

The trustworthiness of qualitative research can be established by using strategies aimed at credibility, transferability, dependability and conformability (Krefting, 1991:217). In quantitative research internal validity, external validity, referential adequacy and factor analysis are used. As this study used both a qualitative and a quantitative approach it employed many of these strategies.

As part of the qualitative research the results were credible (truthful), dependable (reliable) and conformable (applicable within acceptable standards), but not transferable (generalisable) as the study was a single case study that took place in a contextualised setting. Credibility refers to whether the researcher has established confidence in the truth of the findings of the research and has taken into context the roles of the respective subjects or informants. People who share these accurate descriptions would immediately recognise if the results are valid and indeed credible. The results can be regarded as dependable if the data that were collected by using more than one method of data collection. In this regard, the triangulation (using multiple methods in data collection) of results is a measure of dependability (De Vos *et.al.*, 1998:359).

As part of the quantitative approach internal validity (conclusions drawn from the questionnaire are reflected in the results) could be assured, as the data collected were statistically accounted for. Insofar as external validity is concerned, again the study was a case study in a contextualised setting, namely TFS (De Vos *et.al.*, 1998:359).

1.7.7 The research contribution

The first contribution of this research is that a framework for benchmarking elearning is created based on a literature study. "A framework classifies phenomena in terms of the elements they have in common" (De Vos *et.al.*, 1998:338). In this sense, I developed a framework to benchmark elearning at TFS in accordance with andragogical principles. The framework will assist all stakeholders at TFS to develop, design and implement elearning at TFS.

Secondly, the framework for benchmarking elearning can serve as a foundation for writing policy pertaining to the development of elearning at TFS and also for the application to course materials written by lecturers for learners at TFS.

Thirdly, this study can serve as an instrument for convincing all stakeholders of the immense value of elearning and its potential to deliver education over a distance and to a multitude of learners.

Fourthly, the awareness of all stakeholders in elearning of the distinctive approach to adult learners and of their unique characteristics could be raised. Adults approach learning differently, and the learner-centred approach encouraged in andragogy is worth noting.

Lastly, although the framework only focuses on TFS and is contextualised in nature, I feel that it can assist other institutions in similar contexts to embark on elearning and use the framework as point of reference.

1.8 THE RESEARCH PROGRAMME

This study is divided into eight chapters. The first chapter of this thesis sets out to provide an overview of the main components of the study. The rationale, aim and motivation of the study, the research problem, the motivation of the research, the paradigmatic perspective of the researcher, ethical concerns in research and the research design are discussed.

Chapter two will contain the research design. Included in this chapter is the empirical investigation as part of the case study done from May 2001 to May 2003 at TFS.

The development of a framework for elearning commences in chapter three, which focuses on the changes in South African higher education that are taking place as a result of the need for global competitiveness and the requirements set by government in the Higher Education Act of 1997 (RSA, 1997 and SAQA, 2000: [online]).

Chapter four will describe the characteristics of and the requirements for the development and implementation of elearning programmes based on an investigation of the relevant literature.

Chapter five will discuss andragogy as a concept for adult education practice. The proposed framework is contextualised in a particular setting, namely TFS. This in turn will pave the way for a discussion of how learners should be seen as central to the learning process, as well as the imperative change from being merely a teacher/educator in the educational process to becoming a facilitator of the learning process.

Chapter six will provide a description of the research findings based on the collected data, a discussion of the questionnaire by means of visual display (through the use of graphs), an interpretation and discussion of other collected data, and the interpretation of the respective results.

The proposed framework for benchmarking elearning will emerge in chapter seven. The last chapter and the appendixes will provide conclusions and recommendations for future investigation.

1.9 SUMMARY

This chapter serves to provide a general introduction to the study. It has been acknowledged that educational reform is taking place on a worldwide scale and that South African higher education institutions are hard-pressed to improve teaching practice in order firstly to live up to consumer expectations, and then to show continual improvement and innovations in the field of education. Elearning has been implemented at South African higher education providers, but there is no scientific proof that this change in approach has culminated in effective teaching and the improvement of results.

In many cases, instructors hav ew innovation without having prior knowledge of the educational theories and practices underpinning Web-based teaching. It has been ascertained that the absence of a curriculum for an online course in Web-based teaching has not been addressed. To that end a decision was made to develop and implement a framework for the benchmarking of elearning at TFS.

The research problem was then stated, followed by the aim and motivation of the study. The paradigmatic perspective provided an overview of the philosophical foundations underlying the research project. The section on research design described the outline of the research process, including the participants in the study, the research strategy, and the methods of data collection and analysis.

This chapter therefore aimed to create a framework for the study. Distance education and especially elearning are vital instruments in educating the immense backlog of adult learners in our society. Many programmes are delivered, but these need to be of a high quality. Quality can only be guaranteed by measuring programmes in elearning against certain principles. Such principles have to be based on an andragogical foundation to ensure efficiency. The design and delivery of programmes meeting such criteria are the keys to ensuring quality. An in-depth investigation by means of a case study to be conducted at TFS will provide a background to ensure that the quality of programmes is in place. Andragogical benchmarks will form part of a framework that will guarantee that current as well as future programmes meet the criteria for ensuring quality in their design and delivery.

The above context is used to identify the research question, which is set against the background of distance education with the adult as the main focus. Many sub-questions evolved from this new paradigm in distance education. These sub-questions led to a set of objectives for elearning insofar as the design, delivery, quality and efficiency were concerned. This then paved the way for the empirical research design to establish the current situation at TFS and to develop a future framework for elearning as answerable to andragogical benchmarks. Chapter two contains the research design as blueprint of how I conducted research at TFS within a contextualised setting as part of a case study.

Central University of Technology, Free State

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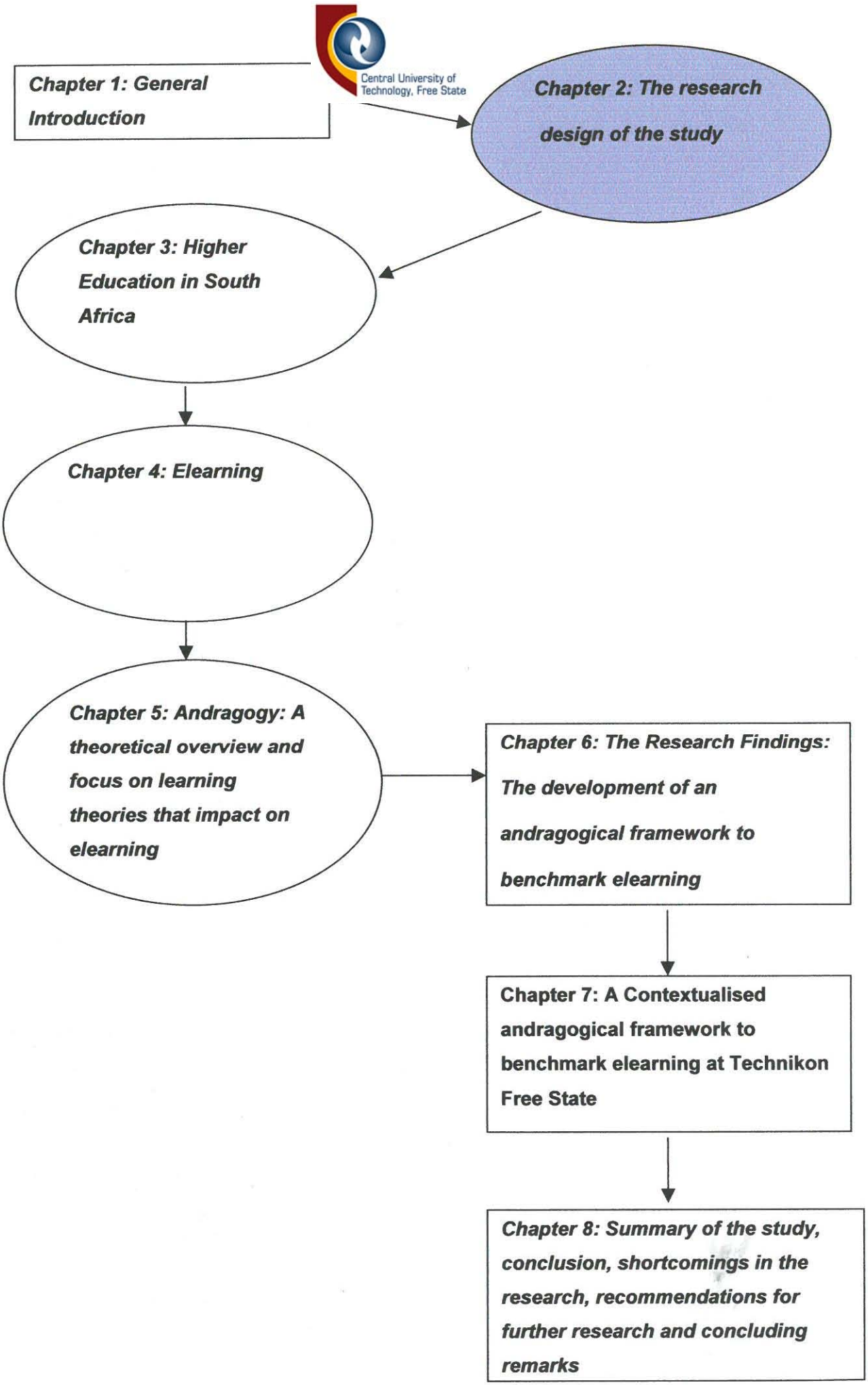
CHAPTER TWO



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2.1 INTRODUCTION

This chapter describes the research design of the research programme. In this regard, research is defined as a structured inquiry that utilises acceptable scientific methodology to solve problems. New knowledge is created that culminates in a body of generalisable knowledge that is acceptable and available (De Vos, et.al., 1998:19).

An overview of the researcher's philosophical perspective towards this thesis is given first in order to act as basis for establishing a theoretical framework. The theoretical framework in this chapter is followed by a discussion of all the research methods and techniques employed within this particular field of research. Subsequently the research design of the study is described, followed by an underpinning of the qualitative and quantitative research approach deployed in the study. The following aspects are important:

- A description of research strategies used and its application in the study is given.
- A description of the data collection methods will be given, leading to an exposition to support the credibility of this research.

2.2 THE RESEARCHER'S PHILOSOPHICAL PERSPECTIVE IN RESEARCH

All research, whether qualitative or quantitative, is based on some underlying assumptions about what constitutes and is seen as "valid" research. Based on these assumptions and the type of research, the appropriate methods are then selected. It is therefore important to know, for purposes of validity and triangulation of the findings, what these (sometimes hidden) assumptions are. The most important and pertinent philosophical assumptions are those that relate to the underlying epistemology that guides the research. Epistemology refers to the assumption about knowledge and how it can be acquired (Hirschheim, 1992 in Myers, 1997: [online]).

Paradigms for research in the qualitative field consist of positivism, critical theory and constructivism. Qualitative research can be positivist, interpretive or critical (see Figure 2.1). Since the qualitative research method is used (as in a case study) the underlying philosophical position adopted is independent from the choice of the specific method chosen in qualitative research (Myers, 1997: [online]).

Underlying epistemology	Positivist	Interpretive	Critical

Figure 2.1: Underlying philosophical assumptions (Adapted from Myers, 1997 [online]).

- **Positive research** tries to test theory to get a better understanding of the phenomena through the use of instruments. The measurable properties are independent from the observer.
- **Interpretive research** understands phenomena by the ascribing of meaning by people to the research and by interpretive methods used. Dependent and independent variables are not predefined, but the full complexity of human sense underpins this research.
- **Critical research** focuses on social critique to bring about change by looking at restrictive-alienating conditions and the decision of whether or not to maintain the status quo. Cultural, political and social domination constrains people to change their social and economic circumstances. The oppositions, conflicts and contradictions in contemporary society are studied and critiqued to eliminate the causes of alienation and domination (Hirschheim & Klein, 1994:83).

The researcher's ideal paradigm to research is not found within one single or conditional analysis or paradigm. The complexity of this research does not lend itself to one major and several minor orientations, but rather a combination of too many assumptions, since this thesis is both qualitative and quantitative in nature. As the approach is fairly complex and within the parameters of society and technology, one needs to look beyond a single approach (Reeves, 2002: [online]).

The researcher's paradigm is one of an eclectic mixed-method pragmatic application, borrowing from other paradigms to gather information and to solve problems. The researcher therefore accepts the multiple-perspective mode, or the mixed-methods paradigms. The main idea and impetus of the "eclectic mixed-method paradigm" is triangulation of different methods. The researcher used multiple methods and different approaches, both qualitative and quantitative, to corroborate the researcher's findings. Pragmatists accept interconnectivity in order to understand and change. Other important aspects are that pragmatists focus on practical solutions in problem solving (Towns, 1997:1 and Ryan, 1995:375).

Mixed methods relate to the re ple perspectives to "triangulate" or "bracket" information and conclusions to understand and study complex phenomena. Pragmatic approaches refer to practical orientation of the study field to achieve control and prediction. As education is always progressing (moving forwards) and changing, pragmatists strive for an improvement in the system (Reeves, 2002: [online]).

Eclectic-mixed-pragmatic paradigmists are concerned with resolving current problems by confronting them realistically. The researcher, as an educator, is concerned about current trends in South African education. Our current educational system lacks the technology and technological equipment necessary to become a global competitor. South Africa is experiencing first and Third World living conditions and lifestyles in close proximity. The researcher's paradigm, namely pragmatism, involves the acquisition and understanding of the phenomena through effective problem solving. Within the context of this study and through interconnectivity of the phenomena, the researcher is seeking to understand and change people's perspectives in order to attain meaningful and effective contributions in education and training (Reeves, 2002: [online]).

The researcher believes that any scientific approach to understanding and improving education is valid. As electronic learning is highly complex insofar as technology, delivery and applicability are concerned, one needs to adjust and adapt one's approaches in education to ensure integration within an ever-changing world. A paradigmatic framework in science helps to systemise, acts as rationale, and is seen as being accountable in organising results of a study. The researcher developed such a framework to provide feedback and systematic advance not only for electronic education but also for education in general. The eclectic paradigm that the researcher chose, as paradigmatic perspective on this research has neither a systematic rationale for decisions nor a framework for organising results and requires to be supported through other paradigmatic approaches such as the interpretistic and critical approaches. In understanding the researcher's philosophical outlook, eclecticism is rather focused on data collection whereas the interpretivistic paradigm is more concerned with qualitative approaches in research (See Figure 2.2) (Tall, 2002: [online] and Reeves, 2002: [online]).

My paradigm in research has multiple angles from different paradigms with pragmatism as the main pivot in my research. I believe as researcher that all paradigms contain some element of truth and therefore are valuable for any researcher. An important aspect of research employed in this study, viewed from a post modernistic angle, is the assumption about rationality and rationalisation. These two principles assume that creating more rationality is conducive to creating more order and that the more ordered a society is the

better – hence the more rationall ages, 2002: [online]). Subsequently research, electronic learning and technology as such are used to bring about order and improve the functionality of societies worldwide. Local situations as experienced in South Africa are fluid and unpredictable, and are dependent on a global scale. The researcher believes that this principle needs to be pursued by thinking and preparing ourselves globally and by acting, repairing and developing ourselves locally (Klages, 2002: [online]). Postmodernist words to support global trends include process, performance, stability, universality, reason and competition.

Furthermore, the greatest benefit of postmodernism that the researcher could find in developing and designing a framework for elearning, was that in a post modernistic society knowledge becomes functional. In today's competitive era one has to not only learn things, one must also use one's knowledge to bring about change for the betterment of all. Outcomes-based education and andragogy also pursue such ideologies. Knowledge, attitude and values, and especially the development of skills, are such ideologies (Klages, 2002: [online]) (see Chapters 4 and 6).

Figure 2.2 shows the different paradigms in research. The mixture of paradigms as part of quantitative and qualitative research methods can take place depending on the type of research.

Paradigm

Philosophical Outlook

Attitude of Mind

Produced by an

Interaction of Personality

and Training

Socio-Anthropological Paradigm

"The whole is more than the sum of the parts"
Study in depth, redefine ideas
UNDERSTAND / EXPLAIN
RELATIONSHIPS

Scientific or Positivist Paradigm

"If something is important, it can be measured" Define clearly, measure accurately. Wherever possible: Compare-Experiment

Data Collection Methods

Qualitative Methods: Open

Participant Observation
Informant (Open-ended) Interviews
Diaries
Logbooks

Qualitative Methods: Closed

Structured Observation
Respondent (closed-ended) Interviews
Multiple-choice Questionnaires
Tests
Attitude Scales, Sociograms

Eclecticism: Occurs primarily in data collection, not in philosophical outlook

Figure 2.2: Different paradigms in research (Adapted from Tall, 2002: [online])

Further elaboration of the researcher's mixed approaches towards research can also be found by comparison in using the various scientific paradigms (Figure 2.2 and Figure 2.3 will illustrate the researcher's approach).

By looking at Figure 2.2 and Figure 2.3 one can see that a single choice of paradigm is not possible in researching complex issues like electronic learning based on the andragogical principle of designing a framework within a contextualised setting such as TFS.

Trochim (2002: [online]) also refers to a more recent development in positivism, namely post-positivism. A common form associated with post-positivism is realism. As a post-positivist the researcher also believes that all observation is fallible and can contain elements of error. Theory formed on observation, needs to be and can be reversible. The researcher therefore used multiple measures and observations (see data collection techniques in point 2.9.) to eliminate the margin of error. Triangulation is used as a means to get closer to the truth or reality.

The researcher also employed constructivist and interpretive approaches as paradigmatic views towards the research conducted. Interpretivism stresses the analysis, interpretation, presentation, outcomes and investigation of the human being as primary research instrument, making it ideally suited to qualitative approaches like observation, individual interviews, documentation, open-ended questions and audiovisual techniques in collecting and studying data. Constructivism is associated with the belief that humans individually and collectively construct reality.

As the researcher's paradigmatic view contains many elements of various paradigms, as post-positivist he is also a constructivist. The researcher's belief is that we construct the world as we as individuals or groups would like to see it. Bias can be eliminated by crosschecking findings in a study or by triangulation. The best solution to a problem is to get as many opinions (multiple perspectives) as possible in the effort to achieve a product (framework) as close to perfection (reality) as possible. The researcher used these techniques to design the framework for benchmarking elearning at TFS (Trochim, 2002: [online]).

As researcher, one is sometimes forced to adopt certain philosophical or paradigmatic views in research. However, there are elements that can be used in every paradigmatic view to assist in one's research. The researcher therefore resides with the main paradigm of pragmatism added by philosophies of science, namely positivism, post-positivism, constructivism and naturalism.

To summarise, a pragmatist looks at "what works", what is of interest and value to him as person, and how to study in different ways that he deems appropriate. Most important of all, a pragmatist uses the results in ways that can bring about positive consequences within his value system to benefit not only himself but also the entire human race (Tashakkori & Teddlie, 2003: [online]).

The figure below (Figure 2.3) sho ; balanced. The researcher needs to position himself to find the correct procedure to conduct research. The data collection methods can then also be chosen to suit the particular research design.

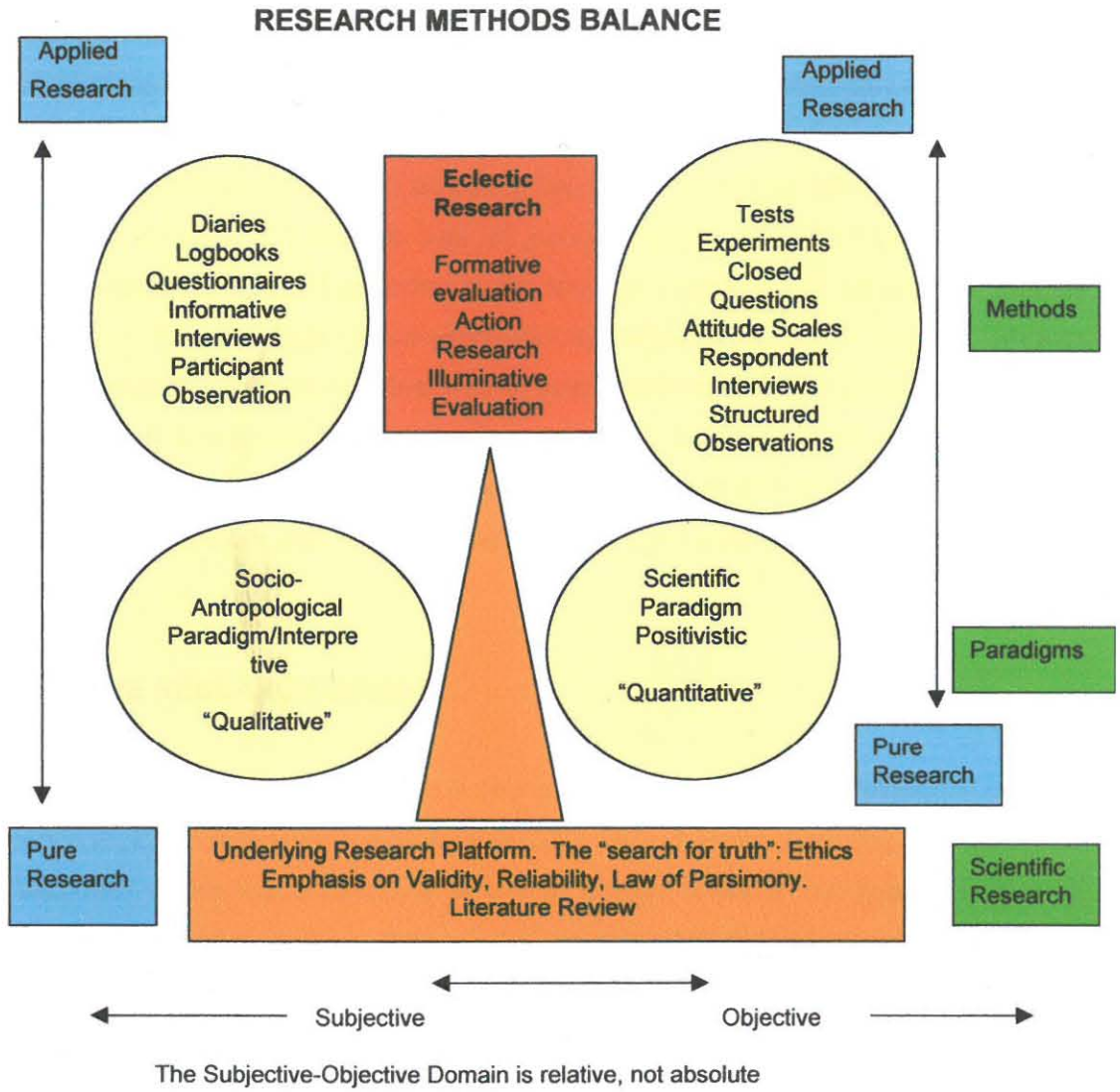


Figure 2.3: The use of various paradigms in research (Adapted from Tall, 2002: [online])

2.3 THE AIM AND PURPOSE OF THE RESEARCH

The aim of the study is to provide a framework for benchmarking elearning at TFS. According to the Institute for Higher Education Policy (2002: [online]) and for purposes of this thesis, the term "benchmark" is used to describe the aim of principles, strategies and guidelines that are concerned with quality education. In general a benchmark is an

institutional behaviour that ensu hnology, the mediating of distance education, or the measuring of any type of education for the purposes of quality assurance (The Institute for Higher Education Policy, 2000: [online]).

The framework is based on andragogical principles that are a unique characteristic in this research. Most learners, and specifically learners in online distance education, are adults. The framework is contextualised, as the research was conducted only at TFS.

Mouton and Marais (1990:132) describe the nature of a conceptual framework by the regulative function it fulfils as part of social science. Three types of conceptual frameworks are present if statements are arranged according to regulative interests of orientation. Statements are never entirely independent. Typologies, models and theories are concepts that form conceptual frameworks, each with its unique characteristics and functions. A functional framework will be used to benchmark elearning at TFS (see Chapter eight). In accordance with the pragmatic orientation the researcher wishes to present a framework that is both practical and functional and which can be used by lecturers.

2.4 THE RESEARCH DESIGN

The function of the research design is defined as a detailed "plan" or "blueprint" of how one intends to do the research study (Mouton, 2001:55 and Thyer, 1993:94). In addition, Moss (1988:439) states that a particular research design is like a "roadmap" to be used to achieve goals and objectives. Thyer (1993:94) adds that in order to achieve these goals and objectives, variables need to be optimised since they can be measured, samples of interest to the study need to be selected, data need to be collected to serve as basis for testing a hypothesis, and results need to be analysed to reach a conclusion.

Rubin and Babbie (1993:92) see the term "research design" as having two connotations. One connotation refers to alternative logical arrangements to be selected, whereas the other connotation deals with the act of designing the study in its broadest sense. Kerlinger (1986:279) uses "research design" for the first connotation and "plan" for the second. The research question in this study is answered by achieving the goals as set out in the research question, namely to design an andragogical framework for benchmarking elearning at TFS. The aim of the research data/information sources and considerations of validity and reliability are aspects included in the research design. Therefore the objective of the research design is to plan, structure and execute the project or specific research in order to maximise the validity through the findings that are studied. Decisions on how to

present a logical basis for researc / an anticipatory specific problem that can occur and by carefully collecting and analysing data. Qualitative and quantitative methods influence the design choice (see paragraphs 2.5 and 2.6)(Mouton & Marais, 1990:193) and KU Communication Studies (2002: [online]). In designing such a framework a particular type of study has to be followed (Mouton, 2001:57). This is needed in order to accomplish the end product (a framework). This study uses empirical studies and non-empirical studies to address the research question. Van der Westhuizen (1998:124) adds that the research design culminates in a product at the end of a study. Assembling, organising and integrating data establish such a product.

Mouton (2001:57) sees empirical and non-empirical research as different design types used in research to justify and classify the different approaches to answering the research question. Creswell (1994:24) prefers using the terminology "quantitative and qualitative approaches" to distinguish between the types of research. One can also refer to the two approaches as paradigms or types of designs, procedures, models, traditions or methods in research (Creswell, 1994:143, 173) and (compare Creswell, 1994:1 and Tashakkori & Teddlie, 2003: [online]).

Trochim (2002: [online]) sees qualitative research as an "approach" that follows a general way of thinking about conducting research. Research is described as either explicit or implicit through the qualitative approach. Foley (2002: [online]) explains that a qualitative design and a quantitative design are both approaches based on the particular philosophy of the research. Both approaches can be used in mixed-method studies to provide more information. Qualitative and quantitative approaches are complementary and not necessarily opposites.

The research design in this study is based on qualitative and quantitative research. The qualitative approach is described as a constructivist, naturalistic, interpretive, postpositivist or postmodernistic perspective (compare paragraph 2.2). Quantitative research is termed as traditional, experimental, empiricistic and positivistic in nature. The table below (Table 2.1) will distinguish clearly between qualitative approaches and quantitative approaches in research (Creswell, 1994:4). Both these approaches are paradigms determining the direction the research project will take (De Vos *et al.*, 1998:239).

ASSUMPTION	QUESTION	QUANTITATIVE	QUALITATIVE
Ontological Assumption	What is the nature of reality?	Reality is objective and singular, apart from the researcher.	Reality is subjective and multiple as seen by participants in the study.
Epistemological Assumption	What is the relationship of the researcher to that being researched?	Researcher is independent from that being researched.	Researcher interacts with that being researched.
Axiological Assumption	What is the role of values?	Value-free and unbiased. Formal.	Value-laden and biased. Informal.
Rhetorical Assumption	What is the language of research?	Based on set definitions. Impersonal voice. Use of accepted quantitative words.	Evolving decisions. Personal voice. Accepted qualitative words.
Methodological Assumption	What is the process of research?	Deductive process. Cause and effect. Static design categories isolated before study. Context-free. Generalisations leading to prediction, explanation and understanding. Accurate and reliable through validity and reliability.	Inductive process. Mutual simultaneous shaping of factors. Emerging design categories identified during research process. Context-bound. Patterns and theories developed for understanding. Accurate and reliable through verification.

Table 2.1: Quantitative and qualitative paradigm assumptions

Adapted from Firestone (1987), Guba & Lincoln (1988), and McCracken (1988) in Creswell (1994:5).

In order to ensure an in-depth answer and systematic approach to the research question, a separate discussion of the methods and types used is needed. To assist in this process Figure 2.4 will give a schematic representation of the research design followed by a discussion on the various approaches used in this study.

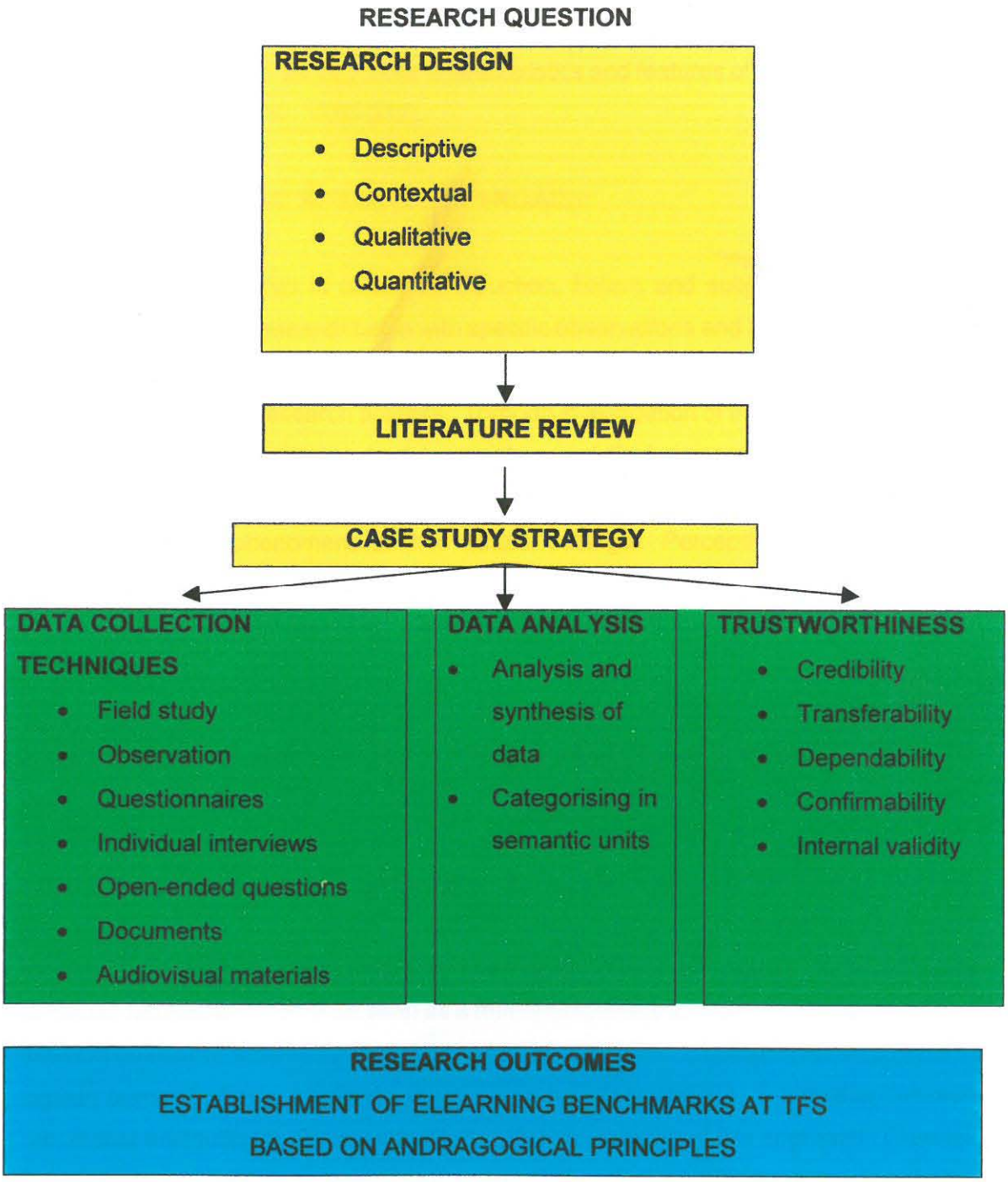


Figure 2.4: Schematic representation of the research design

The researcher commenced his knowledge taken from literature or research based on earlier empirical findings. The researcher used theory to assist in developing benchmarks based on andragogical principles. The testing of theory was not possible, as no previous theory (on the phenomena studied) was present at TFS. Features of non-empirical research can be linked to those of qualitative research whereby appropriateness of methods and theories, perspectives of the participants and their diversity, reflexivity of the researcher and the research, and the variety of the approaches and methods used form the particular characteristics and features of such research (Flick, 1998:5 and De Vos *et al.*, 1998:242).

2.5 A QUALITATIVE RESEARCH APPROACH

The qualitative paradigm is based on induction, holism and subjectivism. Research designs in qualitative research begin with specific observations and build towards general patterns. The researcher had to categorise, organise and see the development of patterns as components of the research process. Through investigation of the phenomena in their natural setting the researcher had to develop analytical, conceptual and categorical components to explain the phenomena studied. However, there are differences in the way researchers study phenomena in their natural settings. Perceptions (points of view, beliefs) have an influence on how research will be conducted (Mouton & Marais, 1990:204, De Vos *et al.*, 1998:240 and Flick, 1998:13).

A qualitative design generally focuses on the individuals' perception of their organisation and environment. Research tends to be from the perspective of the participants in the study rather than that of the researcher. The natural setting or environment is studied. Methods that are common in this type of research include open-ended interviews, ethnographic approaches and simulations (KU Communication Studies, 2002: [online]).

De Vos *et al.* (1998:241) see qualitative research as the concentration of studies of quality of human behaviour. It must be seen as a multi-perspective approach (using and utilising different qualitative techniques and data collection methods). Qualitative research aims to explain human behaviour in terms of valid laws of generalisation. Interaction between researcher and subject(s) or aspects of study forms the basis of this approach. Creswell (1994:4) views qualitative research as reality constructed by individuals involved in the research situation.

The rationale for using a **qualita** cording to Creswell (1994:42), is as follows:

- The concept is immature or new and there is a conspicuous lack of theory or previous research.
- The available theory might be inaccurate, inappropriate or biased, and using or applying the theory has not accomplished much.
- A need exists to develop a frame of reference (framework) or to explore and develop a theory (benchmarks) to describe the phenomenon (elearning).

This study is typified as both **qualitative** and **quantitative** research. Arguments to typify it as qualitative research are as follows:

- The study is conducted in a natural setting (compare Lofland & Lofland, 1984:3). Within the natural setting, the participants and their setting are observed, documented and noted. The study is exploratory, as not much has been written about the topic. The term "contextualisation" means the researcher studies an exclusive population in a contextualised setting (Creswell, 1994:21).

- A single researcher studies the phenomenon elearning through participants and their views on the topic by observing their everyday human actions (De Vos *et al.*, 1998:240). Qualitative researchers focus on the process rather than on outcomes or products (Creswell, 1994:145).

- Data collected through interviews, observation, field notes and the study of documents at TFS give meaning to the study. Such data paint a picture of how meaning, sense, experience and everyday events are conformed into the understanding of how elearning is conducted at TFS.

- Data collected are not analysed statistically, but through the description of elearning as a process data are analysed, in order for meaning and understanding to be justified.

- Fieldwork is conducted through physical contact, while observations of the setting, site and institution lead to recordings of the data in their natural settings.

- The researcher is the primary instrument in collecting the data, and, through an inductive process, builds abstractions, concepts, hypotheses and theories from the

details of data collected. ıevitably lead to the establishment of the benchmarks demonstrated in a contextualised setting by implication of an andragogical framework (Creswell, 1994:145).

- Due to its limitations, qualitative research normally investigates smaller groups so as to ensure quality. In this particular study, ethnographic research employed participant observation studies, field studies and interviews, as well as naturalistic research (Denzin in Mouton, 2001:148).

The following table can assist in clearly distinguishing between the two different approaches to research:

QUANTITATIVE	QUALITATIVE
Objective	Subjective
"Hard" science	"Soft" science
Literature review must be done early in study	Literature review may be done as study progresses or afterwards
Tests theory	Develops theory
One reality: focus is concise and narrow	Multiple realities: focus is complex and broad
Reduction, control, precision	Discovery, description, understanding, shared interpretation
Measurable	Interpretive
Mechanistic: parts equal the whole	Organismic: whole is greater than the parts
Reports statistical analysis	Reports rich narrative, individual interpretation
Basic element of analysis is numbers	Basic element of analysis is words/ideas
Researcher is separate	Researcher is part of process
Subjects	Participants
Context free	Context dependent
Hypotheses	Research questions
Reasoning is logistic and deductive	Reasoning is dialectic and inductive
Establishes relationships, causation	Describes meaning, discovery
Uses instruments	Uses communication and observation
Strives for generalisation	Strives for uniqueness
Designs: descriptive, correlational, quasi-experimental, experimental	Designs: phenomenological, grounded theory, ethnographic, historical, philosophical, case study

QUANTITATIVE	ATIVE
Sample size: 30 to 500	Sample size is not a concern; seeks an "information-rich" sample
"Counts the beans"	Provides information as to "which beans are worth counting"

Table 2.2: Comparison of qualitative and quantitative approaches (Adapted from Foley, 2002: [online]).

2.6 A QUANTITATIVE RESEARCH APPROACH

The quantitative approach to research has its foundations in the predominance of positivism and especially logical positivism in the 1930s and 1940s. The overreaching aim from a quantitative sociologist's point of view is to ensure that constructs tested in the qualitative approach are linked to observable measurements through the notion of operational definitions. To assist in this process statistics are used, hence: "*that a natural science of society could only be value-neutral if subjectivity and prejudice were disciplined by the dispassionate and systematic application of statistical techniques*" (Babbie & Mouton, 2001:48).

The different types of *quantitative* research paradigm are divided into four categories (De Vos *et al.*, 1998:78) and include:

- **Pre-experimental/hypothesis-developing/exploratory designs**. These are quantitative in nature and include observations and/or unstructured or semi-structured interviews.
- **Quantitative-descriptive (survey) designs**. These designs are quantitative in nature and require questionnaires as data collection method.
- **Quasi-experimental/associative designs** include questionnaires or indexes and scales that are not necessarily standardised.
- **True experimental/cause-effect/explanatory designs** are true experiments that focus on cause-effect or explanatory reason.

This part of the study is in its true nature a quantitative method and forms part of the second group, namely quantitative-descriptive (survey) designs. The particular type of design used is a randomised cross-sectional survey using questionnaires. Greenfield (1996:115) defines a survey as a process of collecting information systematically. A defined population is selected and the aim is to construct a data set. Mouton and Marais

(1990:122) see such a goal in c xploratory. Another aim is to make inferences from the data collected through explicit, structuralised and objective methods of sampling, data collection and data analysis (Greenfield, 1996:115).

A questionnaire that is based on scaled questions, as was used in this study, is useful for gathering information on non-exact and more subjective aspects that need to be investigated. Care must be taken not to follow the same sequence in the questionnaire. The questionnaire used in this study retains the same scale, but varies the content and criteria to reduce bias in answers (De Vos *et al.*, 1998:123).

Part of this study can be typified as a **quantitative** approach to research because:

- The setting is highly formalised and more explicitly controlled (Mouton & Marais, 1990:155). The study took place within a particular institution (in this case TFS), with particular key informants and subjects being chosen – on the basis of their role and function at the institution – to complete the questionnaire.

- The range of the phenomenon studied, namely elearning at TFS, was more exactly defined and a specific method was used as part of the research, namely a questionnaire. The questionnaire can be seen as being close to the physical sciences as an instrument of testing (Mouton & Marais, 1990:155).

- By using a survey as method and a questionnaire in particular, internal control and reliability of the construct elearning at TFS could be enhanced (Mouton & Marais, 1990:170).

- Numbers were assigned in testing the properties of the phenomenon by using a Lickert Scale (Babbie & Mouton, 2001:244). A scale is used to attempt to improve the levels of social research through the use of standardised response categories in questionnaires to evaluate.

- The data that were collected at TFS were analysed statistically and presented graphically. The questionnaire was assessed through statistically functional procedures using a Lickert Scale. Criteria used were then statistically analysed using the SPSS™ (9.01) and Microsoft Exel ™ computer programs to establish the mean, mode, standard deviation and the count for each question and each criteria and for graphic presentation (Babbie & Mouton, 2001) and (see Appendices 3, 4 and 5 and Chapter 7).

From this analytical data a framework for benchmarking elearning could be designed, based on information gathered through the study of the open-ended remarks and questions analysed.

2.7 THE CASE STUDY

The research method used to conduct this study was primarily that of a case study. Case studies are conducted within the context of qualitative research. Gall, Borg and Gall in Winegardner (2002: [online]) describe a case study as a distinctive approach to scientific inquiry.

Case studies can accumulate a variety of research designs, data collection techniques, epistemological orientations and disciplinary perspectives, each with its own standards of scholarship (Winegardner, 2002: [online]).

Yin (1994:1) describes the case study as a strategy where "how" or "why" questions are being posed, based on a contemporary phenomenon with some real-life context. Tesch (1990:39) sees the case study as an intensive and detailed study of one individual or of a group as an entity through observation, self-reports and any other means. Creswell (1994:12) describes a case study as the exploration of a single entity bound by time and activity (a programme, event, process, institution or social group) by collecting data through a variety of methods over a period of time to complete the research – in this case elearning regarding TFS.

Mouton (2001:149) interprets a case study as an in-depth description of a small number (less than 50) of cases that are part of ethnographic studies. "General ideas" or "expectations" act to guide the case, as no hypotheses are present. Case studies are analytical in nature and use participant observation, semi-structured interviewing, documents and other existing data as modes of observation. Babbie and Mouton (2001:279) depict a case study as a case directly observed by the researcher while focusing on behaviour and then reporting and evaluating these observations. A unique feature of the case study that distinguishes it from other types of research, is that it focuses on an intense investigation of a single unit and not on population cases. A single unit in this research will be TFS as entity or "case"; although broadly described, case studies can take multiple perspectives into account (compare Kerlinger, 1986:294 and De Vos *et al.*, 1998:125).

Case studies provide contrastin t will assist in developing ideas by studying and making observations. The case study used for the research in this thesis is defined by De Vos *et al.* (1998:125) as a single-short (case) design whereby a single unit is described over a period of time (compare Yin, 1994:18). A unit might include an individual case, family, group, organisation or community, such as in the Free State and in Kimberley in the Northern Cape. A sound perspective is needed based on thorough knowledge of the unit, namely TFS, to ensure validity obtained from observation, key informants and available documents. As it is not possible to observe all staff or personnel, key instruments are chosen to establish and strengthen the quality and applicability of the research conducted. In studying a "case" not all within the case are exposed or possess the knowledge required to adhere to the principles of "in-depthness" (compare Winegardner; 2002: [online]).

The particular type of case study used in this research is the study of organisations and institutions (Babbie & Mouton, 2001:281). Included in such studies are business and management studies, studies of best practice, policy implementation and evaluation, process of change and re-engineering. To study organisations and institutions a case study is an ideal and appropriate strategy for answering research questions. The researcher asks "how" and "why" questions on the research conducted and is not hampered since he has no control over events (Robson in Winegardner, 2002: [online]).

Unique features of case studies are that they are particularistic, descriptive and heuristic and are not mutually exclusive but can commingle as defining attributes. Case studies focus on a particular situation (elearning at TFS), event, programme (elearning) or phenomenon. Real world research and applications make case study research a viable option since practical problems, questions, situations and occurrences in everyday life can be observed directly by the researcher (Winegardner, 2002: [online]).

Various sources are needed when studying institutions and organisations (Winegardner 2002:8 and Babbie & Mouton, 2001:283). The product of multiple sources in the research process would be a thickly described life history (thick description) from the point of view of the subject.

The rationale for using multiple sources (Cook & Campbell, 1979 and Cronbach & Meehl, 1955 in Babbie & Mouton, 2001:283) is based on the ideas of replication and convergence, as "thick descriptions" imply multiple methods and sources. Observations, interviews and the analysis of documents can assist in crosschecking findings to validate

information. No single source c rovide a comprehensive perspective (Winegardner, 2002: [online] and Yin, 1994:12).

To facilitate the justification of the case study in this particular research, the essential characteristics of case studies are listed below with accompanying references to this particular study.

- The case study method focuses on holistic description and explanation by focusing on a single phenomenon or entity (Winegardner, 2002: [online]).

The study investigates a single phenomenon whereby elearning is investigated within a single case (institution) to benchmark elearning according to andragogical principles through the presentation of a framework. Facets of a holistic approach examine the global nature of a programme (elearning) within a single institution, foe example TFS. Yin (1994:42) describes the holistic design as advantageous when no logical subunits can be identified. The underlying theory is that the case itself is holistic in nature. Another problem is the continuous changes that take place when investigating elearning. Difficult orientation emerges as the case study proceeds. This study could serve to address and benchmark elearning within a contextualised setting by providing a framework (Yin, 1994:42, Winegardner, 2002: [online] and Mouton, 2001:149). The phenomena studies are explained in detail. A critical test of existing theory is undertaken to produce the required product, namely a framework. The case is also unique with unique characteristics (Yin, 1994:42). In addition Yin (1994:13) sees a case study as an empirical inquiry that investigates a contemporary phenomenon within its real life context, especially if and when the boundaries between phenomenon and context are not clearly evident.

- This case study makes use of many data collection techniques (compare Mouton, 2001:150, Winegardner, 2002: [online],Yin, 1994:13 and Yin, 1994:93).

This particular study made use of a number of data collection techniques. Techniques used varied from the qualitative approach to the quantitative approach (a questionnaire). Data collection techniques of a qualitative nature included documentation, interviews, direct observation, participant observation, archival records, narratives and open-ended questions. The rationale for the use of multiple data collection techniques is to draw cross-comparisons and to improve internal validity (see paragraph 2.12.5).

Winegardner, 2002: [online]) promotes multiple sources of evidence to address broader ranges of historical, attitudinal and behavioural issues. It adds meaning to triangulation

whereby multiple methods result in a kind of converging lines of inquiry. Any finding or conclusion is arrived at, by using corroborating modes to ensure accurate and more convincing evidence. Paton (1987) in Winegardner (2002: [online]) uses four sets of evaluation in triangulation, namely data sources (data triangulation), different evaluators (investigator triangulation), perspectives of the same data set (theory triangulation), and methods (methodical triangulation) (compare Yin, 1994:92).

- This case study takes place in a natural bounded system that is particularistic, descriptive and heuristic (compare Winegardner, 2002: [online], Mouton, 2001:150 and Yin, 1994:13).

The natural setting of this research approach was within a bounded system, as it only investigated a particular institution (TFS) and a particular phenomenon (elearning) within a particular timeframe and scope. The study is particularistic as it focused on a particular situation, event, programme or phenomenon. Subsequently the elearning (programme phenomenon) at TFS (situation) was studied to establish certain benchmarks. The contextualised setting or bounded system was within the particular institution. The specificity of the research means that the design includes practical problems, questions, situations and everyday occurrences, as required by single case studies. Descriptive features lead to an end product (a framework) as based on a "thick description" of the case. A complete, literal description culminates in the thesis. A heuristic focus on the understanding of the phenomena is brought about by focusing on the known and then adding new information to force new and innovative ideas and investigations into the mind of the reader.

Merriam (1998) in Winegardner (2002: [online]) sees a bounded system if there is a limit on the number of people who can be interviewed or on the observations made. The phenomenon to be studied must be intrinsically bounded. Stake (1995), Miles and Huberman (1994) and Smith (1978) use the case as an integrated system within a bounded context and a bounded system (Winegardner, 2002: [online]).

- This case study is used to investigate new and innovative ways to utilise a new technology (elearning) in an environment where it was not fully functional, so as to assist in improving education.

Although elearning is not a new concept, for many at the particular institution it was used in a limited way and in a limited context. A number of staff members had been exposed to elearning but had never delivered or designed elearning materials. Management was also

sceptical about using new techn turers were prepared to tackle these new phenomena even though very little training or existing support was in place. Many were embarking on this venture for the first time. Many were not computer literate or did not possess skills to implement these new phenomena. During the course of the study the National Department of Education, through legislation, halted the delivery of elearning programmes in their true form. The study is innovative, since no benchmarks or guidelines were in place. The researcher also gained enormous experience and innovative ideas throughout the study. A change in perception, to deliver better educational materials and to use multiple methods to enhance teaching and learning, was also introduced to the institution by means of a framework.

- A single researcher conducts the research (compare Mouton, 2001:150 and Winegardner, 2002: [online]).

A single researcher conducted the investigation and research. The researcher collected all data, with some assistance from the co-supervisor and staff at TFS. The researcher was solely responsible for collecting all primary data and conducting all investigations. All other role-players acted in good faith to assist in collecting information in a limited capacity. Limitations affecting a single researcher include bias or limitations on the part of the researcher, and also the time factor involved in the effort to minimise multiple visits, observations, interviews and data.

LeCompte and Preissle (1993) in Winegardner (2002: [online]) see the researcher's perspective as the final product after having been filtered through the subjective perceptions and biases of participants and researcher as they focus on single factors characteristic of a phenomenon.

- The findings of the study may not be generalised (Mouton, 2001:150 and Yin, 1994: 10).

Case studies can be generalised to theoretical propositions, but unlike experiments cannot be generalised to populations or universes. Unique features of an institution or single case cannot be generalised to other institutions since the researcher's bias and uniqueness may have an influence as such. Elearning is not a new concept and many responses from all concerned do not necessarily substantiate on fact or a previously tested analysis. The fear, uncertainty or lack of knowledge of participants (academic staff, management or support staff) also addresses this issue. Elearning is barely being implemented, and the vast changes in education (Curriculum 2005, Outcomes-based Education) have a direct

bearing on the non-generalisati ternal invalidity (Babbie & Mouton, 2001:242) refers to such results that may not be generalised. In addition De Vos *et al.* (1998:149) explain that generalisation cannot occur, since a lack of comparison exists.

Participants also supplied answers to questions asked in an effort to satisfy the researcher, the institution or themselves. These answers are sometimes acquainted with the Hawthorne effect. This effect is an example of a social desirability tendency where answers are more positively given than in other circumstances (Mouton & Marais, 1990:89).

- The case study is an in-depth investigation (Mouton & Marais, 1990:51).

The focus of this case study is to adhere to contextual interests (internal validity) through exploratory research, descriptive research and explanatory research. This internal validation confirms accurate and valid findings. Deep studying of the phenomena is essential to ensure that constraints have been measured, that the data collected are reliable and valid, and that final conclusions support the data. This principle is adhered to through the use of multiple methods in qualitative approaches (Yin, 1994:92).

2.8 THE ROLE OF THE LITERATURE REVIEW

The role of the literature review is to provide information that is needed to follow the pattern of research. The literature review also enlightens upon the terminology used in the thesis and the process that was followed in conducting the research. Research reports like this one usually contain what is called a literature study or literature review.

Mouton (1996:119) refers to a literature review as a "map" or "maps" of the terrain that has been studied. The purpose of this literature study is to relate previous research to the specific topic that is now under investigation, namely electronic learning according to andragogical principles in a contextualised setting, in an effort to establish a framework. De Vos *et al.* (1998:24) define the literature study as being aimed at contributing towards a clearer understanding of the nature, meaning and trend of a problem that has been identified.

In addition Arkava and Lane (1993:25) indicate three functions of the literature study. Firstly, disclosure is an element of experience relating to similar research that has been done. It adds value to previous research as deficiencies are discovered and rectified, thus fulfilling a demonstrated need. Secondly, a better insight into the dimensions and

complexity of the problem investigated. Stature is given to the researcher, as his literature study will demonstrate his ability and knowledge in relation to the problem. Thirdly, researchers are equipped with a complete and thorough justification for subsequent steps, as well as a sense of the importance of the undertaking. Since the literature study is done beforehand many mistakes can be avoided, thus saving the researcher valuable time when completing the study. Creswell (1994:20) explains that the literature study in the research project has several purposes: (a) Previous research conducted and the results thereof can be shared, (b) Value can be added to previous research by ongoing dialogue, filling in gaps and extending prior studies, (c) A framework is established to highlight the importance of the study that can serve as comparison to other studies through benchmarks that are established. (Also compare Mouton, 1996:171 and Strauss & Corbin, 1990:52.)

Mouton (2001:87) prefers to use the term "review of existing scholarship" as it can tell the researcher more about what he is looking for. Elements in the field of study encompass definitions, different theories, models and hypotheses of the particular research. By looking at data and empirical findings that have been produced and by using existing or developing measuring instruments (questionnaires, scales and indices) the researcher can extend the scope of the phenomena being investigated.

According to Mouton (2001:87) the rationale for a literature review is to ensure that mere duplication does not take place, to discover new and the most recent authoritative materials and literature on the subject based on empirical values, to improve validity and reliability by using or developing instrumentation, and to ascertain the latest and most widely accepted definitions of key concepts in the field under investigation. As noted before, the wasting of time, the making of errors and the mere duplication of material can be avoided through a well-founded literature study, thereby improving the validity and reliability of the research.

Equally important is that the literature study will assist the researcher to plan effectively, to use the best methods available, to identify contradictory findings in previous research, and to eliminate the duplication of previous research (Strauss & Corbin, 1990:52).

The literature study therefore allowed the researcher to develop a theoretical or analytical framework as basis to assist in the analysis, interpretation and collection of data during the research project. A clearer view on qualitative and quantitative approaches and insight was needed to progress beyond the collection and description of facts through the different data collection techniques. Creswell (1994:24) supplied a useful guide to identifying,

writing, planning and locating literature. In qualitative studies literature should be used sparingly at first. The design type, whether inductive or deductive, will then determine whether a substantial literature onset is needed. The audience for the project will be the point of departure. One needs to "frame" the problem and keep it separate. The problem can be used at the end of the study to compare and contrast the findings. The qualitative and quantitative studies in literature are used deductively to answer the research question(s) as based on the hypotheses. Literature is needed at first to introduce the study. Following this is the description of related literature to describe aspects investigated separately. The findings are then compared in a quantitative study plan. If a separate review of literature is used, the researcher must ascertain whether the literature will be integrative summaries, theoretical reviews or methodological reviews to establish the advancement of the particular type of review.

The literature study assists the researcher to identify, write, plan and locate literature in a study (Creswell, 1994:24). Mouton (2001:90) describes the criteria for a good literature review: Literature studies should be **exhaustive** and cover **main aspects** of the study. Secondly, a good review is **fair in its treatment of authors**. Sound judgement and a good knowledge of a topic are needed before one can be judgmental towards authors and their writing. Thirdly, literature reviews should **be topical and not outdated**. Older resources formed the cornerstones of modern research and if they add value to the research they should be included, depending on the topic of the research conducted. Fourthly, the literature review should not be **confined to Internet resources** only. Many articles and Web pages are not peer reviewed or based on properly conducted research. Most scholarly research is still found in books and scientific journals. Lastly, a good literature review must be **well organised** and interactive, and should stem from a cyclical process. Literature reviews should be well structured and logical.

The literature study therefore allowed the researcher to develop a theoretical or analytical framework to serve as basis for the analysis and interpretation of the data that is collected during the research undertaken. Mouton (1996:120) refers to the literature review as a type of "research map". Specific resources are needed to investigate or answer the researcher's question. The type and depth of the study will determine which resources will be used. General resources are used in exploratory and open-ended investigations. Validation and structured studies require subject literature like books and journal articles. A survey of literature is essential, as it guides one to understand the research by reading and studying the body of knowledge that exists through the reviews of other researchers. By means of a thorough review or study of literature, occurrences and relationships are

formed and insight is gained into udied, enabling one to see and form relationships between the facts (compare Creswell, 1994:25).

The literature study in this research was conducted in a manner consistent with the methodological assumptions of qualitative and quantitative research. Inductive generalisation involves the application of inferences from specific observations (such as a sample of cases) for a theoretical population. A sample or a phenomenon, as in the case study employed in this research, can be generalised to the target population (Mouton, 2001:117). Retroductive reasoning involves the use of inferences from observations of data in order to construct or "infer" an explanation of observations made through field research, case studies and so on. This study employed such reasoning as part of the literature review. De Vos *et al.* (1998:282) see inductive reasoning as open ended and naturalistic. The setting of the study guides the researcher to construct concepts, generalisation, models and theories. Deductive analysis requires major categories to act as guide in data analysis. This study employed all three types of reasoning to develop and benchmark elearning and a framework as organising instrument.

Marshall (1997:22) implies that deductive research facilitates and is built on an established theory. Inductive research focuses on a theory that is grounded – therefore grounded theory. Inductive research involves the making of general statements after data are collected and observations made. Inductive research is often exploratory or descriptive. Deductive research starts with a theory and then derives testable hypotheses from the theory. The aim of deductive research is explanatory or theory testing in nature. The difference is that deductive research starts with a theory, as opposed to inductive research where data are the point of departure (Bailey, 1996:25). The figure below (Figure 2.5) shows the steps involved as research moves from theory to hypotheses, then to data collection and analysis, and then finally on to generalisation of the findings. As this study is a case study no hypotheses are present and data collected are used to make generalisations about the case being investigated.

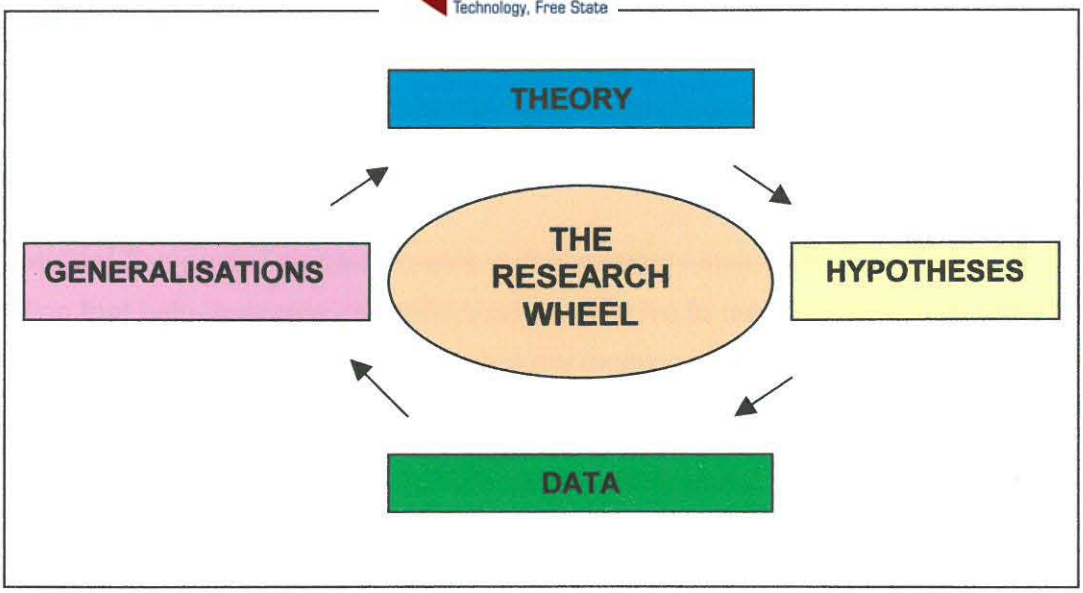


Figure 2.5: The research wheel (Adapted from Bailey, 1996:25)

The credibility of the literature study is an essential component. Control is therefore needed to corroborate the findings and facts as recorded in this literature study. This is achieved by means of:

- Exposure to criticism from supervisor and co-supervisor
- Exposure to criticism during doctoral presentations
- Seminars and other meetings with experts in the field
- Corrective measures after criticism
- Resistance to change in an educational environment and through argumentation
- External examiners and their final control of the study

2.9 RESEARCH PHASES

The under-mentioned phases were followed during the case study at TFS from May 2001 to May 2003:

Phase I: Elearning benchmarks

In addition to reviewing benchmarks that have been published by policy and educational organisations, several articles by prominent authors in elearning were examined. (The selected references at the end of this thesis provide a better understanding of the array of resources reviewed.) Elearning benchmarks were developed by keeping to andragogical principles, the New Plan for Higher Education, the elements as required by

elearning facilitators and relevan iderable overlap existed among the benchmarks developed by the various sources, and, consequently, 49 specific benchmarks were identified. These benchmarks were grouped into the following seven categories:

Institutional Support: The benchmarks in this category include those activities of the institution that help to ensure an environment conducive to maintaining quality distance education, as well as policies that encourage the development of elearning teaching and learning. These benchmarks address technological infrastructure issues, a technology plan, and professional incentives for faculty.

Course Development: This category includes benchmarks for the development of courseware, which is produced largely either by individual faculty members (or groups of faculty members) on campus, subject experts in organisations, and/or commercial enterprises.

Teaching/Learning Process: This category addresses the array of activities related to andragogy, which is the art of teaching and helping adults to learn. Included in this category are process benchmarks involving interactivity, collaboration and modular learning.

Course Structure: The benchmarks in this category address those policies and procedures that support and relate to the teaching/learning process. These include course objectives, availability of library resources, types of materials provided to learners, response times to learner enquiries, and learner expectations.

Learner Support: This category includes the array of learner services normally found on a college campus, including registrations, financial aid, enrolments and learner support, as well as learner training and assistance while using the Internet.

Faculty Support: Since not every faculty member possesses the skills and temperament for Internet-based distance learning, these benchmarks address activities that assist faculty members to teach online, including policies for faculty transitional assistance, as well as continuing assistance throughout the teaching period.

Evaluation and Assessment: The benchmarks in this category relate to policies and procedures that address how, or if, the institution evaluates elearning. These include outcomes-based assessment and data collection.

Phase II: Identification of institution

To qualify for selection the institution must:

- have substantial experience in elearning education
- be recognised as one of the leaders in elearning education
- be regionally accredited and
- offer more than one degree programme via elearning to a broad spectrum of learners (those both on and off campus)

Phase III: The institutional visit

TFS was visited over a two-year period from 2001–2003. During these visitations formal and informal interviews were conducted with management, support and academic staff, as well as learners. The researcher also studied documents compiled by the lecturers, management and staff responsible for the development of elearning. Observations were also made during visitations to investigate the research question of "How can a framework be established to benchmark elearning at TFS as based on andragogical principles?" A questionnaire was also handed out to all the relevant stakeholders who were involved with elearning programmes or their development.

In addition to conducting in-depth interviews with faculty, administrators and learners, a survey using a Likert Scale was administered to the various stakeholders. The survey was also administered to distance education learners who were not able to participate in the interview process primarily because they did not reside near the institution. In all, 83 respondents were approached. The Likert Scale listed the 49 benchmarks and requested each person to rank each benchmark on two criteria: firstly, to what extent the benchmark is true for elearning (ranked from 1 = completely absent to 5 = completely present) and secondly, how important each benchmark is in ensuring quality (ranked from 1 = not important to 5 = very important). Those persons who did not have sufficient knowledge or experience relating to the benchmark could check a "not applicable" box marked as 2. The mean score, mode and standard deviation were computed for each benchmark (see Appendix 2). At the extremes, this process could result in four hypothetical scenarios: a benchmark could be completely present and very important; a benchmark could be completely present and not important; a benchmark could be completely absent and very important; or a benchmark could be completely absent and not important. The actual results are provided in the next section.

2.10 DATA COLLECTION TE[ ]OYED IN THIS STUDY

Data collection can precede or follow theory building. When data collection follows theory building then it is for the purpose of testing or refining the particular theory (Greenfield, 1996:9). As numerous data collection techniques were used in this study, some techniques preceded the forming of a theory and others followed on a particular theory. De Vos *et al.* (1998:48) refer to four basic types of data collection techniques in qualitative research, namely observations, interviews, documents and visual images. Winegardner (2002: [online]) suggests that multiple sources of information are sought in case studies to corroborate and give a comprehensive perspective. Cross-comparison of findings is possible with multiple techniques. This particular study used multiple techniques that included observation, interviews, documents and visual images as part of the qualitative approach (compare Myers, 1997: [online]).

As part of the quantitative approach a questionnaire was used to establish which benchmarks are present within the institution (Criteria A) and the importance attached to each benchmark by the person completing the questionnaire (Criteria B). See Appendix 3 for the questionnaire. Miles and Huberman (1994) as cited in Greenfield (1996:175) suggest five stages for qualitative data analysis, namely:

- Data collection
- Data reduction
- Data display
- Drawing of conclusions and
- Verification of findings

Miles and Huberman (1994:80) suggest the use of an accounting sheet to display data collection techniques and their relationship towards the research questions. Table 2.3 displays an accounting sheet used for data collection.

RESEARCH QUESTIONS	Qualitative							Quan	Lit
	O	II	FN	OQ	D	AV	E	Q	
Dimensions of Distance Education	X	X	X	X	X			X	X
Dimensions of Higher Education	X	X	X	X	X			X	X
Dimensions of Outcomes-based Education	X	X	X	X	X			X	X
Dimensions of Elearning	X	X	X	X	X			X	X
Dimensions of Andragogy	X	X	X	X	X			X	X
Examination Performance	X				X			X	X
Benchmarks of Elearning	X	X	X	X	X			X	X
Lecturer Experience of Elearning	X	X	X	X	X			X	X

Legend	
Qual = Qualitative Research Technique	Quan = Quantitative Research Technique
O = Observations	Q = Questionnaires
II = Individual Interviews	E = Examination
FN = Field Notes	
OQ = Open-ended Questions	Lit = Literature Review
D = Documents	
AV = Audiovisual Aids	

Table 2.3: Data collection in the study

2.10.1 Questionnaires

A questionnaire, according to Babbie and Mouton (2001:242), is a document used in survey research. The questionnaire is used to solicit information appropriate to the research question for all analysis in order to investigate the particular phenomena. By asking questions, certain areas or aspects of the phenomena can be investigated. Questionnaires can be both open-ended and closed-ended. Space could be left open on the questionnaire for remarks, or questions of an open-ended nature could be posed. The technique used for data collection in this research was to leave open spaces for the respondents' own remarks and ideas (compare Trochim, 2002: [online]). Other questions

tested the opinions of participant s on how important they consider the particular phenomenon to be. This may be done by means of a fixed scale (Lickert Scale). This particular method, with fixed answers, is referred to as closed-ended types of questions (compare De Vos *et al.*, 1998:153 and Greenfield, 1996:121).

According to Baker (1988:378) Lickert Scales are most widely used in survey research. Ordinary categories for degrees of agreement usually include five levels: strongly agree, agree, disagree, strongly disagree, and don't know or undecided. Categories are attached for statements. A Lickert Scale is in some ways an index of items with consistently scaled response categories.

The researcher used a Lickert Scale in gathering large volumes of information in a relatively easy manner. A Lickert Scale also simplifies electronic completion, as the answers to questions can simply be marked in the appropriate block. Scores can easily be summed up and averaged by using Microsoft Excel ™ as calculating program. Averages are used to determine the benchmark(s) and their stances proportionately for the criterions measured.

The questionnaires used in this research were delivered by hand and by means of electronic mail (De Vos *et al.*, 1998:154). Questionnaires delivered by hand save time, and, because they are delivered personally, they usually have a higher response rate. The researcher can solve uncertainties pertaining to the questionnaires as they are being collected. Limitations (not in this study) include a too-large geographical area, illiteracy, visual incompetence and writing incompetence (De Vos *et al.*, 1998:155) (compare Greenfield, 1996:121).

Self-administered questionnaires were used, since the population for the study was literate and had a recognisable address – either an office (for written questionnaires) or a mail address. Self-administered questionnaires are more effective and less time consuming than face-to-face interview surveys (where the researcher personally fills in the questionnaire after asking the subject the question). Email or electronic completion also offers the researcher an added benefit. Questionnaires are speedily accessed and are less time consuming to complete. The only negative aspect is that it might not have a good response rate, since the emailer (researcher) is unknown to the subject. The personal touch of hand delivery is not always possible. To combat that, the researcher visited or telephoned each and every respondent and introduced himself in order to eliminate uncertainty to improve response rates and for introduction purposes. The respondent was also asked at this point whether he/she preferred the electronic or

hardcopy version of the questior was a saving in time and money as fewer questionnaires had to be photocopied (compare Babbie & Mouton, 2001:222 and Greenfield, 1996:117).

2.10.2 Open-ended questions

A direct way of gathering data is by asking specific questions. Subjects interviewed not only construct narratives but also social worlds. The aim of any question is to generate data that give an authentic insight into the experiences and feelings of people (Silverman, 1997:100). The rationale underlying unstructured interviewing is the structuring of the researcher's frame of reference on data to be generated. No "yes" or "no" answers are given, but participants can answer in any way they like. An added benefit of open-ended questions is that they do not threaten to bias the findings (Marshall, 1997:38).

Open-ended questions are intended and used, to discover mutual things through talking. Structure and hierarchy are non-elements. Dialogue is an essential component to establish the facts through feelings, impressions, ideals and information (Bailey, 1996:72). Further fractures are generated through interviews as part of qualitative research (Silverman, 1997:101). Since this study uses such techniques, further avenues to study the particular setting were exposed.

As part of the questionnaires, respondents could fill in their respective opinions in the spaces provided. These open-ended remarks were based on categories in the particular questionnaire. These added value to the research and led to further questions and investigations into elearning. Respondents were afforded the opportunity to voice their true feelings and opinions on the research. Many respondents returned their questionnaires via email. Apart from the questionnaire and the responses contained therein, email messages can also be seen as observation tools and a method of data collection. Some respondents responded kindly, others in a more aggressive way, and some respondents stated that they were unable to complete the questionnaire, as they did not possess sufficient knowledge on the particular field being researched.

In addition Flick (1998:83) explains that "open questions" pertain to the interviewee's immediate and at-hand knowledge. The researcher's theoretical presuppositions and his scientific literature form the basis of open questions. Open questions/responses for comment by the interviewee supply the researcher with unanticipated answers. The true feelings/views of respondents can also be discovered. Own opinions and new ideas can be generated.

The point of view of the respondents can be explained. By using open questions/responses for rapport as additions, questions of a closed nature can be discussed (Fowler, 1993:83).

Although open-ended questions/responses form part of interviews, they are discussed separately. As part of the questionnaire open responding is a qualitative approach whereas the questionnaire in this study is quantitative in nature. Therefore all data collected will be discussed separately as qualitative or quantitative analysis for scientific benchmarking (see points 2.7. and 2.8).

2.10.3 Observations

Observation is one of the most important data collection techniques in case studies as part of ethnographic research. Most participants were aware of the phenomenon being studied, namely elearning. However, many were unaware of any research being conducted and of the phenomenon being studied. This gave the researcher an open view to eliminating some bias amongst staff and also to getting a clear picture of current affairs. Both simple observation and participant observation took place (Babbie & Mouton, 2001:293 and Myers, 1997: [online]).

During observation field notes were taken at the scene of action. Field notes must be accurate and the interpretations must be considered extremely important. Only the most important data are kept, as it is not possible to observe everyone and everything. Advantages of observation as listed by Kelleher (1993:122) include:

- It forces the observer to familiarise himself with the subject
- It allows previously unnoticed or ignored aspects to be observed
- People's actions are probably more telling than their verbal accounts, and observing these is valuable
- It is unobtrusive, and when obtrusive, the effect wears off within a reasonable time.

It may be possible to perform direct observation in many cases, but in some cases it is not. The role of the researcher varies from being a full participant or complete observer to being a simple observer. De Vos *et al.* (1998:308) see the observer as one who must observe and interpret correctly by taking verbal and non-verbal expressions into consideration. Staff at the institution studied was sometimes aware of the research being conducted and sometimes not. Subjects can be devised for the purposes of reliability and

validity. Babbie and Mouton (20 subjects will be more natural and honest if they are uninformed or misled. By taking up a position of mixed-mode participation, the observer gives a better and clearer picture of the research being conducted, as the researcher receives a mix of different emotions, ideas and inputs (compare Myers, 1997: [online]).

The most important rationale for observation was to gain a true understanding of elearning at TFS. Once the researcher had noted down all the ideas, evaluated the benchmarks of elearning, studied the documents and interviewed all the key informants, he could proceed to design a framework based on andragogical principles as suited to the needs and wants of the particular institution.

2.10.4 Individual interviews

Mouton (2001:152) sees individual interviews as part of surveys and as methods of research. Individual interviews form part of surveys where face-to-face (one-to-one), telephone (researcher interviews by phone) and group interviews (researcher interviews informants in a group) are all types of interviews that are qualitative in nature. Individual interviews are useful when informants cannot be directly observed. One limitation in individual interviews is the fact that interviewees provide "indirect" information through their own points of view (Creswell, 1994:150). This study makes use of individual interviews as method of data collection.

Babbie and Mouton (2001:243) see interviews as a data collection encounter. A person (interviewer) asks questions of another person (interviewee) (one-to-one or face-to-face) in order to gain insight into a particular phenomenon that is being studied. Face-to-face interviews are extremely useful when a low level of literacy, e.g. computer literacy, exists among interviewees. This study employed face-to-face interviews as additional data collection method to study the phenomenon. Successful interviewing is dependent on social interactions and involves specific norms, expectations and social rules (Babbie & Mouton, 2001:229). The research used this method to collect data that was not possible to collect by means of other collection techniques employed in this study. The advantage of the researcher being the interviewer is that specific questions can be asked of key informants in the study.

Bailey (1996:78) distinguishes between informal interviews and structured interviews. Using multiple methods in research not only broadens one's perspective but also improves the principle of in-depthness. Information gathered can also be corroborated by means of

cross checking techniques. Inform npt to find out more information about the setting and the person. Structured interviews focus on pre-prepared questions about specific matters and are bound to time and scheduled in advance. Specific questions are asked to gather specific knowledge from the respondent on the research question.

De Vos *et al.* (1998:297) view the interview as one of a universal mode of systematic enquiry whereby the interview is seen as a pipeline to extract and transmit information from interviewer to interviewee. This research employs informal conversational interviews based on the immediate context in a natural setting whereby no predetermination of question topics or wording exists. The onus is on the researcher to do verbally true transcribing for comparative references.

Standardised open-ended interviews are interviews where the exact wording and sequence of questions are determined in advance. All respondents are asked the same questions in the same order. The researcher used a tape recorder to facilitate such a process. Answers were transcribed to text and comparisons drawn. The completeness of data, as well as an increase in the salience and relevance of the questions, are added benefits (Greenfield, 1996:170).

Greenfield (1996:175) considers the rationale for the interview and sees it as an excellent method of data collection, since large amounts of expansive and contextual data can be recorded quickly. Data are collected in a natural setting and interviews lend themselves to the observation of non-verbal behaviour and communication. Complex interconnections can be discovered that exist in social relationships. The subjective side of the native's perspective of organisational processes is also discovered through the process of interviewing (compare De Vos, *et al.*, 1998:299).

According to Lofland and Lofland (1984:21) and De Vos *et al.* (1998:299) using selected interviewees as key informants adds a deeper meaning to the particular issues to be studied. Numerous sessions of interviewing characterised by tactfulness give deeper insight into the research topic. Greenfield (1996:129) and Babbie and Mouton (2001:249) define the purpose of the interview as being to find out what is in and on someone else's mind. Interviewing takes place in order to find out what we cannot directly observe. Tesch (1990) as cited in Creswell (1994:153) sees interviews and the collection of data as electic. Comparisons and contrasts are drawn based on the nature of the interview. Information gathered is then managed and reduced to a meaningful analysis.

Using key informants in the study archer to discover specific data not otherwise measurable, throughout the other research methods employed in the study. Critical research questions that were investigated include:

Firstly: Has the institution (TFS) adopted a new direction and approach to implement elearning as mode of instruction?

This was very important, as "andragogy" specifies such a move as principle. Another important reason was that elearning and the delivery thereof require certain critical aspects embedded in andragogy to be successful. Furthermore, by assessing the current affairs, a framework could be designed, with the aim of implementation in a contextualised setting (TFS as institution) based on these principles. Such interviews were necessary to establish the current position of elearning at TFS. Once this had been established, benchmarks could be set in place in a framework to guide and act as lead for future programme development. Key informants also supplied valuable knowledge as experts in their own field.

Secondly: Through the information gathered during interviews, areas of concern could be investigated. Plans could then be made through interviews to streamline the framework to fit higher education in particular but also to address the principles of andragogy.

Thirdly, to orientate lecturers into realising that changes have to be made. New technologies and the new plans for higher education necessitated this move. The shift away from a rigid system to a more flexible one was a matter of urgency. This move not only brings the institution in line with andragogical principles, but with the current affairs of Outcomes-based Education (OBE), Open Learning (OL), Learner-centeredness, Resource-based Learning (RBL) and Recognition of Prior Learning (RPL). The framework also incorporates these principles (see Chapter 4).

2.10.5 Documents

Creswell (1994:152) suggests that a protocol needs to be followed to record information when using documents and audiovisual equipment. Such a protocol should include information about the document or material, as well as key categories that the researcher requires in answering his research question(s) as sources of information. The study of documents as primary sources is more valuable than the study of secondary material based on the primary source. Many primary sources are changed to suit the institution or

for personal reasons. As far as po er obtained primary documents, and if this was not possible, used different documents to corroborate his findings.

Mouton (1996:77) refers to sources associated with extensive collections of records and documents, library collections, or mass media material, as being archival or documentary resources. The researcher studied and gathered information from numerous sources, including minutes of meetings, future planning of elearning at TFS, policy decisions and on-site reports.

Tesch (1990:24) describes document studies as a non-qualitative approach whereby the subjective experience of individuals and their construction of the social world are examined. Such personal document studies result in typologies to classify and categorise elements into usable units as part of research (Mouton, 1996:144). Documents also provided the researcher with insight into certain settings (which would not be possible otherwise) by analysing documents. Since documents assist the researcher with additional information they can be help to fill gaps in research and also corroborate findings. In turn the study of documents is essential for triangulation purposes (Bailey, 1996:78).

Babbie and Mouton (2001:300) indicate that the greatest asset for the researcher in studying documents is that the human element or personal characteristics of a person are given final expression and meaning through text. In addition the reader of the document becomes acquainted with the others' personal style and feelings on certain issues. While reading numerous documents the researcher was able to experience the feelings of lecturers in having to adapt to new changes in education. Authors also utilise documents to convey their true feelings, as they are not directly involved with their superiors as during personal meetings or in-group discussions.

Silverman (1997:47) notes that documents cannot be used as "firm or official" evidence, since they are constructed according to their own conventions within a particular setting. However, documents are useful in organisational settings, according to cultural beliefs and values that are inherently attached to them and for their unique and distinctive forums. As this study is conducted in a contextualised setting the relevancy of documents becomes of greater value if multiple sources are used. A clearer picture emerged as the researcher studied and was able to understand the content and direction of the documents measured against other data collection techniques employed in the study. Silverman goes on to say that documents must be used as primary data in their own right, as they have unique and distinctive characteristics within a particular setting.

Confirmability can assist the researcher to "audit" the documents studied through analytical perspectives. In doing so, other documents can be referred to in an effort to "audit" or "confirm" previous data (Silverman, 1997:52). The researcher studied various documents and, through fieldwork and own documentation, was able to "audit" previous documents as well as new documents studied

2.10.6 Audiovisual aids

As part of a qualitative approach in data collection film, video and photography are used to document and record social life (De Vos *et al.*, 1998:322). Responses of informants or on-site visits can be captured and data recorded or photographs can be used to record and remember data. Creswell (1994:150) notes that the interpretation of photographs may be difficult, since the observer might disturb or hinder the natural occurrence of events.

Harper (1994:403) identifies documentary photography as research built on theory. Visual track is kept of reality that was recorded in a socially and technically constructed world. The researcher visited learning centres to gain firsthand knowledge of elearning activities and also to capture theory and practice of the constructed world where e-delivery takes place. Credibility of photographs culminates in a body of evidence based on common reasoning. Activities that accompany the photographic detail and observations made by the researcher will ensure that the observations made are reliable and valid.

Ethical considerations, as discussed earlier, must be kept in mind when using photographs in data collection. The data collected must be organised, created into understandable data (statistically) and presented in verbal or graphical format. The researcher needs to guard against personalising photographs that focus on the true picture and what is represented. In this regard photographs need to be accompanied by other data gathered to improve the validity and reliability of the phenomenon studied (Harper, 1994:410)

2.11 ANALYSIS OF THE QUALITATIVE DATA

Qualitative research is concerned with understanding behaviour rather than explaining or predicting behaviour. Such research is ideal when the area of enquiry is new and unexplored (Marshall, 1997:42). The feelings and ideas of the people studied are more important than the researcher's own values, opinions and preferences.

Data analysis aims to reduce da e and interpretable form (Kerlinger, 1986:125). In turn data need to be analysed and interpreted so that relations for research problems can be studied and tested and conclusions drawn (De Vos *et al.*, 1998:203). Three steps are identified in analysing data, namely data reduction, data display, and verification (Miles & Huberman, 1994:10). It is, however, important to note that there is no right way of analysing data, and Creswell (1994:153) sees data as being eclectic (compare Greenfield, 1996:122).

Marshall (1997:25) sees data analysis as the use of comparison, categorisation and connectivity as elements of analysis, specifically in case studies. De Vos *et al.* (1998:48) refer to data analysis as a process whereby data is analysed and then reduced into categories and themes for a coding procedure.

The aim of the analysis and interpretation of qualitative data collection is to discover underlying meaning and patterns of relationships (Babbie & Mouton, 2001:242). Strauss and Corbin (1990:123) see data collection, analysis and theory in a reciprocal relationship. As Creswell (1994) states, all three aspects, namely collection, analysis and theory, are interwoven and one does not necessarily precede the other. Mouton (2001:108) views data analysis procedures as a culmination of all fieldwork. Data need to be analysed into manageable themes, patterns, trends and relationships. In addition the aim of any data analysis is to understand the various constitutive elements through interpretation of such data against the background of constructs, concepts and variables. Patterns, trends and relationships will emerge from such analysis. The subsequent paragraphs will shed light on some considerations in the analysis of qualitative data. Data analysed will assist the researcher to design a framework based on andragogical principles in a contextualised setting.

2.11.1 The role of the researcher in qualitative analysis

Mouton (1996:152) describes the researcher as having a definite influence on participants in research by providing positive feedback. Systematic approval of a response could influence the participant and the information obtained. Direct involvement in a subject's "world" is a key element of this type of research. Gold (1958:217) distinguishes at least four types of roles a researcher as participant fulfils, namely full-participant, participant-as-observer, observer-as-participant, and full-observer roles. As such these skills are important in developing a total quality management system for benchmarking at TFS.

Researchers need to know that th loes not provide answers to research questions. Interpretation of data is necessary to give meaning to data. Only then can relationships be formed. According to Miles and Huberman (1994:428) researchers must realise that they are responsible for the systematic, coherent manner of data collection, storage and retrieval. Textual narratives, journal descriptions of observations (field notes) and records are usually voluminous. Schurink (1996:3) proposes three types of storage and retrieval of data that includes master files (difficult to access and failsafe), background files (links between research data) and analytic files (newly found material). Coding of these files forms an essential component of the storage and retrieval information.

Morse (1994:25) as cited in De Vos *et al.* (1998:340) is of the opinion that researchers are always in search of answers, seeking to be actively involved in observation and ensure accurate recall. Tesch (1990:154) adds to this by proposing steps to consider data analysis. A sense of the whole must first be gained and then the researcher will work towards greater detail by categorising and analysing data.

Bailey (1996:4) describes results from field observations as ***"thick descriptions"***. Sufficiently detailed descriptions of data in context are collected and then studied to determine whether any similarities between various contexts exist. Sufficient detail and precision allows the researcher to make judgements about transferability (Babbie & Mouton, 2001:277). Creswell (1994:158) suggests that researchers should address *internal* validity. Internal validity addresses the accuracy of information against the background of information against the background of reality. Triangulation between sources is needed to corroborate the findings in a study. Through feedback, informants facilitate the making of accurate assumptions. Distance between researcher and informants should be minimised. The researcher in this study was actively engaged in all aspects and involved himself by using multiple sources to investigate the phenomenon, namely elearning.

The researcher's frame of reference, namely andragogy, was met with slight resistance at first. Once staff realised the enormous potential of andragogy and how it integrates with and is similar to outcomes-based education (OBE), a change of mood could be felt. Elearning, especially in higher education, is best facilitated through an andragogical approach whereby learner-centredness is a key principle in andragogy, as opposed to pedagogy where teacher-centredness is a key element. The analysis of data and the view of the researcher stand central to an andragogical concept.

2.11.2 Preparing qualitative da

Data were collected by means of observation, interviews, open-ended written answers, field studies and documents. Data had to be transcribed into written format before they could be utilised. Data were written on A4 paper in uniform format by using specific categories. Interviews and open-ended written answers were then typed in the same format (compare De Vos *et al.*, 1998:48).

Mouton (2001:104) suggests that data should be collected as accurately as with as much detail as possible. By using classification as point of departure, data can be placed for easy assess (numeric or text) within a typology. Myers (1997: [online]) explains that data are affected by the researcher's perspective. Analysis affects the data and data affect the analysis. Myers prefers to use "modes of analysis". Qualitative data is concerned with textual analysis (whether verbal or written). Strauss and Corbin (1990:30) note that one needs only transcribe as much as is needed. One needs to be selective as the study progresses and either select material that is related and applicable to the evolving theory, or discover such theory. The principle of "better more than less" should be followed.

Creswell (1994:152) advises the researcher to have a protocol to assist in categorising data. Data reduction is essential in dealing with the voluminous amount of information to process results. These results must be joined to form a holistic view or a larger, consolidated picture (as cited in Tesch, 1990:97). By referring to Miles and Huberman (1984), Creswell (1994:154) asserts that the concepts and information can be displayed in tables. This is achieved by means of "coding categories". File cards, folders or computer software can be used. Strauss and Corbin (1990) provide a series of data analysis steps for grounded theory that uses open coding, axial coding, selective coding and the generation of a conditional matrix (compare Yin, 1994:102).

2.11.3 Procedures for qualitative data analysis

There are several stages in the collecting and analysing of data, according to Greenfield (1996:122). These include coding, editing and preparing the data for analysis. However, a clear distinction exists between procedures of analysing data in qualitative studies and such procedures in quantitative studies. Qualitative research focuses on a wealth of rich descriptive data. The research strategy is usually of a contextual nature. Coherence and meaning of data are more important than the specific meaning of the parts of the data. Methods employed in data analysis are thus more holistic, synthetic and interpretive (Mouton, 1996:129).

Trochim (2002: [online]) refers to key analytic strategies in analysing data by coding, memory and the use of integrative diagrams and sessions. Strauss and Corbin (1990:31), also support these strategies. Systematic techniques and procedures are based on a grounded-theory approach to qualitative research. Fowler (1993:127) supports the view of coding whereby the researcher can develop an interactive process between the researcher and TFS (respondents to identify categories to groups and differentiate between different data). Coding places data in analytically meaningful categories.

In this study data that were collected were transcribed and reduced. Data were placed in categories and subcategories for finer analysis. This was done by using the following strategies, as described further in Chapter 6:

Coding of data: Coding is a process of categorising data and describing the implications and details of these categories. Looking at minute details through open-coding processes creates initial categories. Selective coding follows this process by systematically coding with respect to a core concept (Trochim, 2002: [online]). Greenfield (1996:122) sees coding as the conversion of verbatim answers to categorised data. A coding frame can be used to minimise time constraints. Silverman (1997:122), by referring to interviews, also defines analysis as the systematic coding of data. Yin (1994:102) refers to coding as finding patterns in case studies. If patterns coincide internal validity can be strengthened.

Open coding, axial coding and selective coding are three methods of coding. Open coding refers to the process of breaking down, examining, comparing, conceptualising and categorising data. Axial coding uses a set of procedures to follow open coding by making connections between categories. Conditions, context, strategies and consequences are set within the researcher's coding paradigm. Selective coding selects core categories by further refining data. Further refinement and development of categories takes place through systematic interaction with other categories (De Vos *et al.*, 1998:50). Babbie and Mouton (2001:240) describe coding as a process whereby raw data are transformed into a standardised form suitable for machine processing and analysis. A conceptual framework assists in coding and classifying data. The framework could also act as guide to develop specific methods of observation within the boundaries of that framework for the Department of Total Quality Management at TFS.

Qualitative research is concerned with the depth rather than the specificity of understanding data. Validity and reliability are affected by using a depth approach to investigation. The innermost nature of phenomena has depth understanding as its goal

and requires the involvement and of data to be analysed, as well as the maximisation of comparisons and the sensitisation of concepts of such data (Mouton & Marais, 1990:128 and Babbie & Mouton, 2001:388). As this study is typically a case study, interviews are conducted, documents are studied and observations are made as part of the qualitative data collection technique. The depth dimension forms the essential cornerstone of this study.

Data editing is an essential component for reducing data and editing the data gathered. Not all data conform exactly to the logical structure of what is being tested or measured. Through the use of computers data can be edited as they are prepared for analysis. Pre-tests and pilots also help to minimise the effects of errors when research is conducted and are therefore essential. Pilots and pre-tests are valuable when new procedures; environments or phenomena are investigated (Greenfield, 1996:121). Tesch (1990:187) also supports the use of pilots and pre-tests, as a content analysis program requires preliminary work for efficient analysis. In addition, data have to be edited, since the creation of a framework requires data that are valid and reliable. The questionnaire in this particular study was pre-tested by TFS staff that had knowledge of questionnaires and testing procedures.

Mouton (2001:108) promotes data editing. Data are collected in different formats and have different properties. Textual data are rich in meaning and need to be edited to eliminate multiple meanings found and to capture the essential sections by structuring the wording. Again, this approach was put to good use in the research at TFS during which data were transcribed and edited.

Other data such as numeral data need to be sorted, processed and analysed before an interpretation is possible. The three steps in research involve data collection, data preparation, and data analysis and interpretation. Data editing forms part of data preparation. Mouton (2001:109) refers to data capturing errors that include capturing errors, post-coding errors, too many missing values, and omission of data validation procedures as a first step in data analysis (Flick, 1998:217).

Mouton and Marais (1990:137) define a **typology** as a conceptual framework. The framework serves to organise and classify phenomena with similar characteristics. Further refinement in frameworks can lead to main classifications with sub-classifications. The basic unit of a typology is the type or the ideal type and is identified through a level of abstraction. Selection of phenomena takes place in order to find relationships between constructs (types) and phenomena (that are typified). Classification of phenomena,

including processes of exhaustive xclusiveness, is included. Typologies serve as a framework reference for observation and data collection. Typologies also offer a framework for analysis, especially to construct true and exact outcomes for TFS elearning modes and types of instructional offerings at the main and regional learning centres.

In addition, Bailey (1996:93) uses typologies to assist the researcher in giving meaning to and differentiating between phenomena. Bailey supplies three guidelines to be followed when creating types in a classification, stating that the scheme must be mutually exclusive, exhaustive, and theoretically meaningful. Babbie and Mouton (2001:158) refer to typologies as a set of types of categories to attempt to construct an index or scale in ordinal measures of given variables. Typologies also serve as a device for understanding data normally as based or as single variables. Mouton (1996:190) adds that typologies also assist to make the collection and analysing of data easier, as data are systemised in the typology through common identity.

De Vos *et al.* (1998:338) further refine typologies through two approaches: the emic and etic approach. Emic approaches refer to first-order concepts that are based on categories of meaning assigned to people in classification. Etic approaches refer to the researcher's concepts or paradigmatic view and are secondary in nature. This study also uses typologies and its subtypes (emic and etic) to establish a conceptual framework for categorising, classifying and analysing data.

2.11.4 Procedures for quantitative data analysis

This study employs a questionnaire using a Lickert Scale. Since only one type of method is involved, the focus will therefore be on procedures pertaining to questionnaires as part of surveys in a questionnaire approach. De Vos *et al.* (1998:202), by referring to Read and Smith (1981:242), explain that the purpose of the study guides the analysis and interpretation of data. Data gathered could be processed and analysed either manually or by computer. The questionnaire was used to determine the *presence* and *importance* of the benchmarks for elearning and to give participants a chance to remark on the various categories in the questionnaire. Data gathered were then summarised and displayed by means of charts (see Chapter 7).

In using a questionnaire, responses were graded according to certain criteria. The analysis was done manually in order to ensure and assist the input of data into the

computer. The computer prograr data was the Statistical Package for the Social Sciences (SPSS™ Version 9.01).

The Lickert Scale was used firstly to measure whether certain attributes were present in the contextualised setting studied and secondly to determine how important these attributes were for TFS. By measuring, one has to ascertain or clearly define what needs to be measured. By using predetermined categories in a questionnaire the fields that need to be investigated are categorised. Items as part of a questionnaire were created through brainstorming or were obtained from literature or other resources and previous research, or from the database of TFS Total Quality Management. Pre-testing or piloting carried out in an effort to eliminate errors can bring about a reduction in the number of questions. The researcher piloted the questionnaire by using experts to reduce the number of questions in the questionnaires while improving their quality (Trochim, 2002: [online]).

Questionnaires were distributed in electronic format through email or alternatively were personally delivered in hard-copy format. To improve the response rate all respondents were identified and contacted telephonically to determine their preferred questionnaire format. Mass email also served to motivate participants to complete and return the questionnaire. Typologies assisted the researcher to categorise the questions into areas of investigation. Furthermore, participants in the study were identified earlier as having some degree of experience and knowledge with regard to the phenomenon being investigated.

Mouton (2001:103) identifies sources of error when conducting research using questionnaires and scales in quantitative approaches. Errors most commonly made include a lack of piloting or pre-testing, as well as ambiguous or vague items, double-barrelled questions, item-order affects, fictitious constructs, leading questions, negatively phrased questions or double negatives, poor and confusing layout, too-long instruments, sensitive or threatening questions, and avoidance of motor operational bias. To minimise the most common errors the researcher employed two statisticians and an expert on the phenomenon to pre-test and pilot the questionnaire.

The questionnaire adhered to the principles of design and operationalisation. The scale used in the questionnaire constitutes a valid measure of the key concepts in the research question to improve measurement validity. The population used to complete the research was selected in a mutually exhaustive capacity with regard to the phenomenon being investigated. Categories used in the scales were unambiguous and mutually exclusive.

Scales used were unambiguous al in that a single phenomenon was investigated (Mouton, 1996:110).

2.12 THE TRUSTWORTHINESS OF THE RESEARCH

Where humans are used as a major form of data collection one is inclined to question and disbelieve research findings. Tesch (1990:44) sees humans as having similar levels of trustworthiness as the form part of qualitative naturalistic studies, as opposed to other types of qualitative research methods used. Trustworthiness can also be measured against the principles of reliability and validity. Absolute truth, according to Tesch (1990:71), does not exist and needs to be discovered. Canons of trustworthiness in qualitative research are nestled within the design types and their formulation.

Validity refers to whether an instrument measures what it is supposed to. Validity is a term that describes a measure that reflects the concept it is intended to measure (Babbie & Mouton, 2001:248). This study is focused on external validity, which refers to the approximate truth of conclusions that involve generalisations (Trochim, 2002: [online]). Internal validity focuses on effect and causal relations and is not relevant in most observational or descriptive studies.

Mouton (1996:112) sees the dimensions of validity as theoretical validity, measurement validity, representivity, reliability and inferential validity. Dimensions of invalidity or error include conceptual vagueness, measurement error, biased samples, comparable data and invalid conclusions.

De Vos *et al.* (1998:85) define reliability as the accuracy or precision of an instrument. Mouton (1996:142) sees reliability as a precondition for measurement validity. The object of data collection is to produce reliable data. As observation methods are relatively unreliable the researcher used multiple methods to collect data. Marshall (1997:79) suggests the use of different dimensions of the same concepts. By implication this study used different methods to study the same concepts, thereby improving reliability. The greater the degree of reliability, the more validity can be exercised (compare Mouton, 1996:142). Figure 2.5 shows the aspects of reliability and validity by means of target shooting.

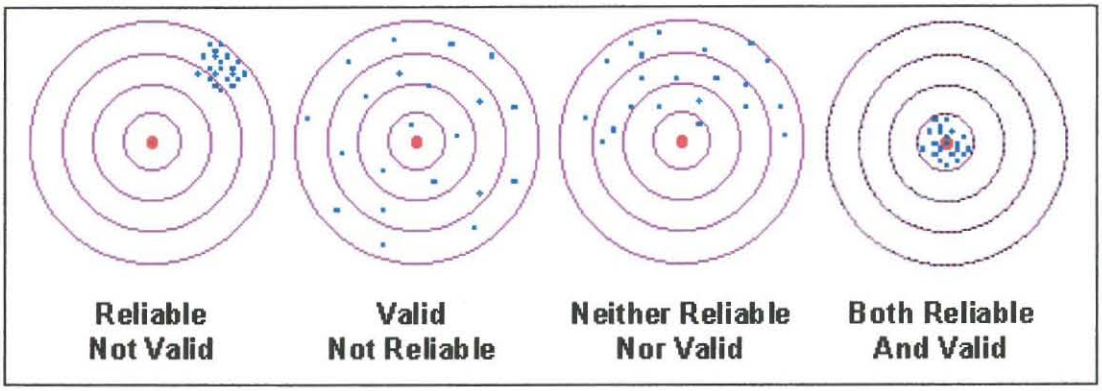


Figure 2.6: Reliability and validity measurement as implicated through target shooting (Adapted from Mouton, 1996:142).

Guba and Lincoln, as cited in Trochim (2002: [online]), offer alternative criteria for judging the soundness of qualitative research as opposed to the more traditional-quantitatively oriented criteria of internal validity, external validity, reliability and objectivity (see Table 2.4).

TRADITIONAL CRITERIA	ALTERNATIVE CRITERIA
Judging quantitative research	Judging qualitative research
Internal validity	Credibility
External validity	Transferability
Reliability	Dependability
Objectivity	Conformability

Table 2.4: Different approaches to establish criteria in judging qualitative and quantitative research (Adapted from Trochim, 2002: [online])

In addition Gough and Reid (2002:21) also prefer to use transferability, credibility, dependability and confirmability. Hence, transferability can be described as traceability and dependability as honesty. The process of qualitative research is used and evaluated against certain criteria instead of the "worth" of the narrative composed and presented in the research report.

Threats that influence the trustworthiness of qualitative research include:

- Failure to include essential descriptive information.
- Lack of clarity of description.
- Lack of credibility of description.

- Inadequate length of time d for vivid descriptions.
- Insufficient depth to description.
- Insufficient skills in writing descriptive narratives.
- Reluctance to reveal the self in written material.
- Inadequate self-awareness.
- Poor observational skills (Gough and Reid 2002:21).

The position of paradigmatic view influences the benchmark and criteria used in assessing qualitative research. Some researchers' criticism against qualitative research is that it is inferior to quantitative research. However, other researchers with a postmodernistic view point out that no criteria exist to evaluate the outcomes. Popay, Rodgers and Williams (1998:344) prefer a third method whereby criteria are accepted as equally applicable to the evaluation of any research product. The major difference in the third approach is that difference in research is also acknowledged. More importantly, two fundamental differences exist within research, which include the type of knowledge that differentiated knowledge can create (i.e. epistemological difference) and the type of reality or object to which different methods are relevant (i.e. the ontological difference) (Gough & Reid, 2002:22).

The researcher believes, however, that the paradigmatic view is very important. The researcher's point of view is an interpretative one. The interpretative paradigm focuses on interpreting or understanding human behaviour rather than explaining or predicting it (Babbie & Mouton, 2001:243). This research employed techniques to facilitate such a point of view. The researcher acknowledges, however, the perspectives of others. Trustworthiness in this study can therefore be measured against credibility, transferability (traceability), dependability (honesty) and confirmability.

2.12.1 The credibility of the findings

The criteria used to establish whether the facts or results of qualitative research are credible or believable from the perspective of the participant lies within the credibility of the findings. The phenomena in research studies can only be legitimately judged from the participants' point of view to determine whether or not findings are credible or believable. Cutcliffe and McKenna (1999:1) see a distinct difference in the philosophical and methodological position to establish whether the research is trustworthy. Interpretative methodologies need to be evaluated on the basis of the same philosophical, epistemological and methodological underpinnings.

Furthermore, qualitative researcl s and communicate the interactive process used in acquiring the data for the study. To evaluate qualitative research and credibility as such, a variety of approaches can be followed. Researcher bias can be minimised by enlisting the help of an expert in the area being investigated. The accuracy and interpretation of data can be increased in this way (Cutcliffe & McKenna, 1999:4).

Guba and Lincoln, as cited in Cutcliffe and McKenna (1999:4), suggest that an "**audit trial**" should rather be used to add credibility to the findings/facts in the data analysis, since other researchers can then check and verify the decisions made. Trochim (2002: [online]) and Cutcliffe and McKenna advocate the process of "**memoing**". Memoing is a process of recording thoughts, ideas, key concepts and so on, which evolve throughout the study. At first these memos are very open but become more focused and structured towards the end of the study.

In addition a researcher's neutrality can minimise his subjectivity and thus maximise the credibility of the findings. Good qualitative researchers can make explicit their pre-suppositions and acknowledge their subjective judgement (Cutcliffe & McKenna, 1999:5). Creswell (1994:157) adds that the notions of validity and reliability are still used by traditionalists in research and especially the evaluation of qualitative research. To address the issue of internal validity, the accuracy of information and its match to reality can be enhanced through triangulation of findings (see point 5.12.5.)

Creswell (1994:158) identifies certain steps to improve the accuracy of information. Firstly, Creswell recommends the use of an "audit trail" to validate the decisions made. Secondly, feedback from informant's "member checks" can be made through discussion with informants on categories or themes. Thirdly, the distance between key informants can be minimised so that those key informants can be participant observers in the study and can review findings as they emerge. Mouton (1996:108) points out that the rationale of any validity in research is to eliminate possible errors or minimise errors in the research process. The findings in research are the true test of whether or not a high degree of validity is present (see Fig. 2.6. on validity). By using objective methods one can increase the validity or trustworthiness of the research.

De Vos *et al.* (1998:331) mention four aspects to ensure trustworthiness when utilising audiovisual methods like photographs, namely truth-value, applicability, consistency and neutrality.

- Truth-value refers to credi s and whether confidence has been established in the findings and the subjects. As part of the truth-value aspect the researcher used triangulation, member checking, prolonged field experience, structural coherence and referential adequacy to ensure the credibility of the photographs used.

- Applicability of the findings refers to the application of data to contents and settings. As this study is conducted in a contextualised setting the applicability of information gathered can be applied to other areas. There is, however, concern that the information is unique and cannot be generalised to other settings without adaptation (De Vos *et al.*, 1998:331).

- Consistency refers to the consistency of findings and the reliability of the same or similar subjects. Krefting as cited in De Vos *et al.*, 1998:331) defines consistency in terms of dependability. The researcher corroborated the data through triangulation and peer reviewing.

- Neutrality encompasses the non-biasness of findings founded in informants and conditions as set by the researcher. Motivations and perspectives of different role players are eliminated through the conformability of the findings. The researcher used confirmability audit, triangulation and reflexivity in field notes, studies and other techniques described earlier to confirm the findings (De Vos *et al.*, 1998:331).

2.12.2 The confirmability of the findings

Comparability focuses on the degree to which the findings are compared in relation to the focus of enquiry based on facts and not the biases of the researcher (Babbie & Mouton, 2001:278). In addition Trochim (2002: [online]) describes comparability as the degree to which the findings of the researcher are confirmed or corroborated.

Strategies used by the researcher to corroborate findings include the checking and rechecking of data accumulated. Data auditing can be done to enhance the collection and analysis of data. Judgements can then be made on the auditing and corroborating of findings based on data. Trochim, (2002: [online]) states that auditing of data is done to authenticate the data collected. The process is used to establish findings of representation by checking confirmatory documents. Furthermore, verification with

participants can establish and cor ecorded are a true representation of what actually occurred (Stainback & Stainback, 1988:101 and Flick, 1998:23).

Guba and Lincoln, as cited in Babbie and Mouton (2001:278), use the audit trail to determine whether conclusions, interpretations and representations can be traced to their original and verifiable sources to support their comparability. At least six classes of data are used to verify or confirm data, namely:

- Raw data: Videotapes, written field notes, documents and survey results.
- Data reduction and analysis products: Field notes drawn up on the basis of assumptions.
- Data reconstruction and synthesis products: Themes used, developed, explained and presented in a final report (thesis).
- Process notes: audit trail notes, methodological notes and worthiness notes (documents).
- Instrument development information. Pilots, preliminary schedules, observation funds and surveys (individual interviews, questionnaires and audiovisual recordings) (Babbie & Mouton, 2001:278 and Flick, 1998:232).

The researcher did not use an outsider to audit documents, but the supervisors as well as qualitative data were used to triangulate the findings of the researcher. Findings and data were corroborated on the basis of their confirmability by the co-supervisor who is a TFS staff member. Dr K. de Beer proved invaluable in the "auditing" of the data collected, as he has firsthand knowledge of research and the areas investigated by the researcher. In using "key informants" the researcher's bias or distributed views can be rectified.

2.12.3 The dependability of the findings

Lincoln and Guba (1985:290) see dependability as an attempt to account for changes in conditions of the phenomena studied and chosen for research. An attempt to account for such changes also rests within the design to be refined so that the researcher's understanding of the setting can be improved.

According to Flick (1998:232) dependability is checked through a process of auditing based on similar principles as used in the financial domain. Proceedings and developments in research can be revealed and assessed through the steps followed by the researcher. The assumption is that a study is based on the replicability or repeatability

of the study, whereby the same r ined under the same circumstances (Trochim, 2002: [online]).

Dependability emphasises the researcher's accountability for his own research. As the research in particular qualitative studies are ever changing (dependable) the researcher must account for and describe these changes and how they affect the research.

The researcher perceived numerous changes as he progressed in his research. New laws came into being (e.g. the Higher Education Act) and distance education (including electronic learning) was extended from Technikon RSA and the University of South Africa (UNISA). These changes impacted heavily on the future of elearning at TFS. Elearning and other learning programmes suffered heavily. These changes hampered the development of programmes and also had a negative influence on staff feelings towards this newly introduced phenomenon.

Krefting (1991:22) defines dependability as the "consistency" of the finding, thus implying that the researcher's findings have to be consistent. A lack of consistency in findings can also indicate shortcomings in research and is deemed to be as important as consistent findings. Dependability refers to the comparison between the researcher's categories and interpretation of data collected and what is actually true. The more consistent the findings are with reality, the more dependable the research and the researcher's findings.

To summarise De Vos *et al.* (1998:351) proposes tactics that can be used to evaluate credibility, dependability, transferability and confirmability. Biases can be eliminated by checking for representativity and researcher effects (reactivity), triangulating the findings, and weighing the evidence. Through discussions (see point 2.8.) it has been shown that all processes to evaluate the research are justified and corroborated. The subsequent discussion of triangulation as method to evaluate the research will show and prove that the practices/criteria in evaluating qualitative research have been adhered to (compare Miles & Huberman, 1994:438).

2.12.4 The transferability of the findings

Transferability refers to the degree to which results can be generalised or transferred to other contexts or settings. Transferability or generalisability of findings can primarily only be brought about by the researcher himself. Qualitative studies do not aim to understand or describe the phenomena of interest and therefore the one conducting the study is responsible for generalising the results. Therefore the researcher has to do a thorough

study so that the research content can be transferred/generalised based on sound judgement and sensibility (Trochim, 2002: [online]).

There is, however, a difference of opinion amongst researchers regarding the use of different terminology. Researchers use external validity as opposed to transferability. The term external validity normally resides under quantitative studies, but is not widely accepted. The nature of qualitative studies as stated is to understand or describe phenomena in their natural setting. Generalisability to large populations is therefore not an accepted practice. Instead, qualitative researchers use terms like transferability or comparability as concepts that can confirm external validity. Tesch (1990:42) refers to reliability and validity as traditional vocabulary to assess the quality of research. Guba as cited in Tesch (1990:47) prefers to use the term trustworthiness.

According to Baker (1988:214) external validity places a question mark over establishing how far research findings can be generalised. Generalising the findings of studies done in a natural setting causes problems, as it is not possible to replicate the same circumstances. Too many factors such as people, institutions, specific areas and so on are difficult to control and jeopardise research and the transferability thereof. External validity, as seen by Baker, is more a quantitative evaluation criteria.

The researcher's point of view also influences transferability or comparability of research findings. Baker (1998: 247) points out that an impartial observer might offer counterviews or support the contentions of the researcher. Needless to say that the more support the researcher receives the more external validity and reliability will improve. In order to accomplish greater external validity and reliability the researcher must open up so that colleagues who operate on the basis of different assumptions can support him.

External validity refers to the approximate truth of conclusion that involves generalisations. Threats to external validity (generalisibility) include people, places and times. These three factors influence external validity as they all influence whether or not the findings can be generalised. The other problem is that all three factors have multiple modes of change and are not stagnant (moveable) in nature. To improve generalisability is to draw a large enough sample to investigate, minimise dropout rates of participants and use multiple methods of data collection to corroborate findings. Replication of a certain section of a study can be done to improve the ability to generalise (Trochim, 2002: [online]).

Generalisability or transferability was very difficult to accomplish, as this study was done in a contextualised setting.

Creswell (1994:15) points out that no single stance or consensus exists on topics such as validity and reliability insofar as generalisation or replication of studies is concerned. Creswell, by referring to Erlandson, Harris, Skipper and Allen (1993), states his preference of "trustworthiness" and "authenticity" as criteria in assessing qualitative studies. Creswell (1994:158) points out that the intent of qualitative studies is not to generalise findings, but to investigate and interpret the uniqueness of events through description and understanding.

Krefting (1991:215) sees "reliability" and "validity" as being relative to a quantitative study. The details of such terminology do not fit qualitative research. Krefting elaborates by saying that the major purpose of qualitative research is to generate hypotheses. Such hypotheses will encourage further investigation instead of testing the particular hypotheses. By implication such situations do not warrant external validity, according to Krefting.

Agar (1982) as cited in Krefting (1991:215) suggests a different language for qualitative and quantitative analysis by referring to "trustworthiness" to replace validity and reliability. Terms such as "credibility" or "representation" and "authority" of the writer are suggested for use as underpinnings of trustworthiness in qualitative research.

De Vos *et al.* (1998:34) view transferability as fittingness to assess the applicability of qualitative data. The person who has to generalise or conform the findings to another situation or population probes the degree of similarity between contexts. Transferability of findings is possible, provided that sufficient descriptive data exist to allow for thorough study and comparison.

Lincoln and Guba (1985:291) view transferability as the researcher's transfer of data as perceived, rather than the original investigator's research to demonstrate the applicability of his own findings and apply it to another context. Transferability is seen as a criterion to evaluate qualitative research.

2.12.5 Internal validity

Internal validity refers to the possibility that conclusions drawn from experimental results are suspect (Babbie & Mouton, 2001:43). According to Trochim (2002: [online]) internal validity is the approximate truth about inferences regarding cause and effect or causal relationships. A change is needed, as both these definitions imply a quantitative approach

towards the research. Strauss an 9) support the view that the canon or standards used to judge qualitative studies are inappropriate. Canons or standards are equal to criteria as used by other authors. Modification is needed to use canons as identified in research.

Lincoln and Guba (1985:290) state that the goal of applying credibility is to demonstrate that the research findings are accurately identified and described. The principle of in-depthness through the thick descriptions given and the complexity thereof as derived from the phenomenon studied in its setting makes the research valid.

2.13 TRIANGULATION OF THE FINDINGS

Triangulation as a procedure to measure validity had its roots in military navigation where sailors at sea triangulated among different distant points to find their position and the ship's bearing. Convergence among multiple and different sources of information is used to form themes or categories in a study (Creswell, 1994:124). Interviews, observations, documents and audiovisual aids were used in this thesis as qualitative methods to supply the researcher with multiple forms of evidence to triangulate the findings as collaborative evidence or research. The researcher used these methods mentioned above to triangulate the findings of his research.

Triangulation in its pure sense refers mainly to the use of multiple methods of data collection. Using multiple methods in data collection as part of quantitative and qualitative studies is aimed at increasing the reliability of observations during research (De Vos *et al.*, 1998:359). Greenfield (1996:9) refers to triangulation as a process to check whether different data sources and different methods would yield the same effects and outcomes.

According to Creswell (1994:159) reliability of observation is not possible, since each study in qualitative research has a unique setting and has specific properties within the setting that make it unique. The changes of a study being replicated can be entrenched through the researcher's selection of informants, the biases and values of the researcher, the selection of informants and the catered assumptions. Creswell (1994:157) prefers to refer to quality criteria in qualitative research as "trustworthiness" and "authenticity".

Mouton and Marais (1990:91) accept that the inclusion of multiple sources of data collection is likely to increase the reliability of observations. Using multiple methods minimises the shortcomings of certain methods through corrections in data. Mouton (1996:152), in referring to Campbell and Fiscke (1959), also uses the term "multiple

operationism". What is importa at specific types of data collection methods are designed and used only for the collection of certain types of data. Triangulation can be done according to paradigms, methodologies, methods and researcher's.

Duffy (1993:143) assigns practical meanings to triangulation and identifies four different types of triangulation, namely:

- **Theoretical triangulation** involves the use of several frames of reference or perspectives in the process to analyse data of the same set.
- **Data triangulation** is aimed at using a variety of sampling strategies through the gathering of observations to ensure that a theory is tested in more than one way.
- **Investigator triangulation** uses multiple observers, coders, analysts and interviews in a particular study.
- **Methodological triangulation** uses two or more methods of data collection procedures within a single study (compare Flick, 1998:229).

Greenfield (1996:9) describes triangulation as the process of checking whether different data sources and different methods allow the researcher to reach the same conclusions. Using different methods to check the results can enhance the accuracy of a theory in the context of a particular setting. Flick (1998:50) adds that the combination of appropriate research perspectives and methods must be suited to the research being conducted by taking the many different aspects of a problem into account. Systematically extension and completion through possibilities of knowledge production can act to ground knowledge obtained through qualitative methods. Triangulation is less a strategy for validating results and procedures than an alternative to validation (Flick, 1998:230).

This study employed multiple sources of data collection as triangulation strategy. Methods employed included virtual observation, individual interviews, documents and open-ended questions as qualitative methods. The data collected were reduced using qualitative techniques and categories where identified and clustered.

Miles and Huberman (1994:222) point out that by using different theories, data sources and methods, different researcher triangulation may be achieved. Different sources have different biases and strengths and should be included to complement each other. If the findings of several methods of data collecting agree, the findings can be judged as being credible.

When I, required more detailed information about certain aspects of the establishment of the benchmarks based on andragogical principles that did not emerge from the observation documents, questionnaires and open-ended questions, he held specific individual interviews with **key informants**, who allowed the researcher to gain greater insight into specific aspects.

To further corroborate findings the researcher visited the regional learning centres of TFS to make more observations and collect additional documents to study the phenomenon. Audiovisual techniques, particularly photographs, were also employed to highlight and justify the findings. Harper (1994:403) depicts photographs as excellent tools in demonstrating real life situations to assist the researcher in corroborating findings and getting a "real picture" of current affairs as part of the field setting. The researcher used photographs to establish what the current situation regarding the phenomenon studied on the TFS main campus and also at the four regional learning centres. Shortcomings could easily be identified and recommendations based on multiple sources made with the assistance of photographs. In this way triangulation as strategy was used effectively. The regional learning centres consisted of Maluti-A-Phofung (Qwaqwa), Moqhaka (Kroonstad), Matjhabeng (Welkom) and Sol Plaatje (Kimberley).

Harper (1994:402) places great emphasis on the credibility of photographs. Photographs and their images are seen as "true" in the sense that they hold a visual track of reality at the point in time when the camera was being aimed. Social and technical construction underpins the images and their relationship with the world. Credibility is therefore based on common-sense reasoning and evidence, rather than on the quality of the photograph. Validity and reliability are measured on the basis of whether the photograph reveals the evidence the researcher requires in answering the research question. The researcher employed photographs as data collection method in conjunction with other methods, including tape recordings and the transcription of interviews.

Triangulation in its versatility does not lead the researcher to one specific point of "truth" where the lines of triangulation converge. Positivists would argue that such a point exists, as there is just one single given fragmental, tangible, measurable convergent, while constructivists would argue that no single truth exists, but that reality exists in the perspectives of individual people (Cantrell, 2002: [online]) (see point 2.2.)

Ethics in science are concerned with principles of right and wrong in conducting research. These principles that govern research are in line with accepted norms and values. Codes of conduct of principles regulate behaviour of researchers within the scientific community as enforced through societies and association, universities, technikons, and in some cases funding agencies. Codes vary from discipline to discipline and from institution to institution (Mouton, 2001:239).

Ethics also arise from interaction between people, animals and the environment. Ethics are concerned with establishing good conduct between different entities. The search for truth is what societies long for, but it should not be at the expense of the rights of other individuals in society. Issues of anonymity, confidentiality and privacy are ethical issues to consider when conducting research (Mouton, 2001:239) (compare Fowler, 1993:135).

According to De Vos *et al.* (1998:24) ethics can be defined as a set of moral principles that offers rules and behavioural expectations about the most correct conduct torwards experimental subjects and respondents, employers, sponsors, other researchers, assistants and learners. In keeping with this definition the researcher conducted research at TFS whereby ethical principles guided decisions further. In this way ethically guided decisions later become part of the total lifestyle of the researcher.

Fowler (1993:135) explains that it is clear and mandatory that no harm should come to experimental subjects and/or respondents. In social studies such harm is/can be mainly emotional, but physical injury is not ruled out completely. Subsequently Dane (1990:44) claims that the responsibility of preventing any harm rests within the ethical obligation to prevent harm to respondents. Vulnerable or case-sensitive respondents can be eliminated prior to the research. During the research, researchers should also continually compare the investigation to real life in order to prevent harm. All possible situations cannot be ruled out during the investigation or beforehand. The researcher selected only certain respondents who have had previous exposure to the phenomenon in order to minimise sensitivity, since newly introduced respondents could have been damaged emotionally (inability to understand).

2.14.1 Informed consent

To ensure complete consent, all respondents need to know about and receive adequate information on the research. The goal of the investigation, procedures that will be followed, possible advantages and disadvantages, as well as the dangers to which the

respondents will be exposed m iis consent. The credibility of the researcher and the placement of accurate and complete information are assisted in the comprehension and participation of subjects. The researcher supplied a letter (Appendix 6) to cover all the issues pertaining to consent of the respondents. Participants must also be legally and psychologically able to give their consent. Participants were also aware that research was being conducted and were under no obligation to participate. Information that was supplied by subjects during observations and interviews was given anonymously to ensure the confidentiality and privacy of the subjects (De Vos *et al.*, 1998:28) (compare Greenfield, 1996:118).

The researcher was given permission from the Deputy Vice-Chancellor: Academic of TFS, Prof. CAJ van Rensburg (2001: [interview]), to investigate the particular phenomenon. All respondents to questionnaires and in field research were informed about the phenomenon, namely elearning, and the particular study under investigation by the researcher. Clear instructions for completing the questionnaire were also given to respondents, and the cover letter explained and supplied background information on the study. All the respondents, during observation and interviews, also gave their informed consent to the researcher. After guaranteeing informed consent, documents as supplied by key informants were studied.

2.14.2 Anonymity

Dane (1990:51) sees anonymity as a circumstance where nobody, not even the researcher, will be able to determine who the subjects are or what their respective opinions were. As most of the questionnaires were emailed back to the researcher, he could establish who the respondents were. To honour the promise of anonymity each questionnaire was printed out immediately with the respondent's control number, after which the e-files were deleted. The researcher subsequently worked only on the basis of the data received. Confidentiality of the information supplied by subjects could also be ensured, as the information was included in a general report wherein reference was given only to the subjects. Average score on the Lickert Scales is what counts, not who the respondent is or what he/she does. The researcher and not individual responses scaled the information. Sensitive data were only discussed with the co-supervisor who is a TFS staff member (Baker, 1988:75).

Anonymity ensures that the information supplied will remain anonymous even for the researcher. This principle is based on promises made when sending questionnaires to respondents who return them anonymously. The researcher employed this technique by

using email. However, this is not ethod, since when replying an easily identifiable email domain is supplied. Some questionnaires were hand delivered and collected, which also compromised anonymity.

Control numbers were used to determine how many questionnaires were returned. This was done to see how many individuals from the different groups (management, academic and support staff) completed the questionnaires. High return rates could have been achieved, but the researcher would then have been unable to see who had answered and returned the questionnaires. Respondents were also assured of another principle, namely confidentiality, to protect them (Baker, 1988:75).

In this way data that were not appropriate or too sensitive to report on, were generalised so as to still impact on the recommendations and shortcomings in the studying of the phenomena.

In publishing this thesis care was also taken not to publish sensitive information that could be harmful to TFS, its departments or its employees. Dane (1990:58) implies that the researcher is solely responsible for fulfilling in the ethical aspects of the research. An interesting issue is the freedom of speech for researchers. The researcher's personal belief is that if something can be said or done to improve education, but not at the cost of an individual, department or organisation, then that action should be taken (compare Greenfield, 1996:118). Information that was supplied by subjects during observations and interviews was given anonymously to protect the confidentiality and privacy of subjects (De Vos *et al.*, 1998:28) (compare Greenfield, 1996:118).

A Lickert Scale was also implemented. Where open-ended questions existed respondents could add their own points of view. The researcher then used this information to collaborate with other data and make recommendations based on this acquired information (De Vos *et al.*, 1998:22).

As many different data collection techniques were employed in this study the researcher had to make sure that the appropriate, informed procedure of consent for each investigation was followed. All situations were dealt with in the best possible ethical manner. Complete explanations of the total investigation without pressure or unnecessary interference in clear understandable language must always be given to eliminate errors (De Vos *et al.*, 1998:27).

2.14.3 Deception of subjects

Deliberately misinforming or withholding information from subjects in an effort to persuade them to participate is not within the parameters of ethical conduct. Judd as cited in De Vos *et al.* (1998:27) offers three reasons why subjects may be deceived, namely:

- To disguise the real objective of the study.
- To hide the real function of the actions of the subject.
- To hide the experiences.

If, however, subjects are mistakenly misinformed, as the research progresses a discussion on this sate of affairs or rectification can take place during the restoration interview (De Vos *et al.*, 1998:27). Subjects in this study were not deceived in any way.

2.14.3 Confidentiality

Confidentiality is a promise to keep the identities of the subjects known only to the researcher. The researcher also promised confidentiality to all respondents. The personal telephone call to each respondent helped the researcher to ensure a good return rate. Many respondents received email questionnaires but were also contacted personally and promised confidentiality even though their anonymity would be compromised. Since respondents had a heavy workload, the option of emailing the questionnaires and using just an (**X**) to mark their feelings and points of view on the criteria also ensured an easy and quick way of gathering multiple sets of data. Data were then printed out and analysed further by means of statistical procedures (Baker, 1988:7).

In field research or a case study confidentiality can be given to respondents by using only averages or codes to store data. A warning should also be given as part of informed consent, since the Internet is not always failsafe. At TFS confidentiality could be assured, since as the Intranet (internal) system was used. TFS uses Pegasus mail to ensure virus-free, safe and confidential delivery of electronic mail. The final data assembled focuses only on averages to establish benchmarks and does not compromise any respondents' confidentiality.

Privacy implies the element of personal privacy, while confidentiality includes the handling of information in a confidential manner. As elearning and the investigation of this phenomenon is case sensitive, the researcher mostly used general feelings and data

averages to minimise the risk to [redacted] also to promise subjects privacy and confidentiality.

In survey research certain approaches can be followed to ensure the protection of the respondents. Questionnaires elicit information about certain sensitive issues. Respondents are sometimes deterred from completing such questionnaires, as they feel insecure or threatened when revealing their true feelings or beliefs. Hence the aim of survey research is not to gather information from a single source but rather from the entire sample to find aggregated data (Baker, 1988:75).

Respondents should be made aware of the fact that the total (general) norm is used. Respondents will not be concerned if they form part of the establishment of a larger norm (Baker, 1988:75).

Principles that were used to establish the privacy of respondents included privacy, anonymity and confidentiality, as well as informed consent.

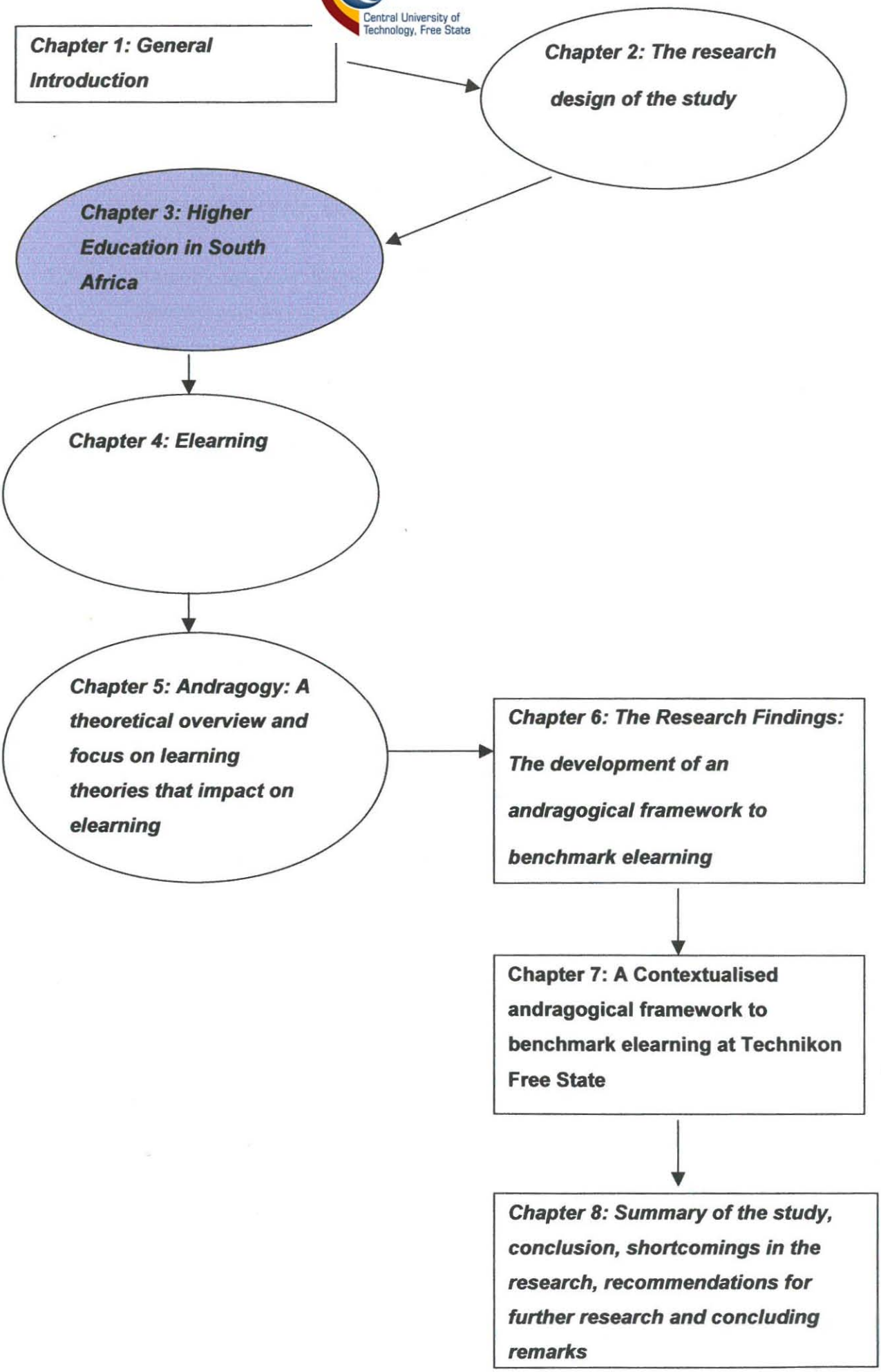
2.15 SUMMARY

In this chapter an overview of theory in research designs and the technologies employed was given to provide a theoretical framework for research methods and techniques employed in this study. Emphasis was placed on the uniqueness of qualitative and quantitative data collection techniques as based on the paradigmatic view of the researcher, being multidimensional, interpretative, eclectic, pragmatic and holistic in nature. The specific research design of the study was then described and underpinned by the two approaches employed in the study. Research strategies were described followed by a description of data collection techniques used as part of qualitative and quantitative approaches. A case study was implemented at TFS. The analysis of the collected data was described next. A full and detailed exposition of the trustworthiness of the research followed in which credibility, dependability, transferability and confirmability were discussed as elements of the qualitative approach, and internal validity as element of the quantitative approach. Comparisons between these two approaches were drawn in order to clarify grey areas and then enlighten the uninformed. Lastly, a discussion followed to highlight the function of the conceptual framework in social sciences. This was necessary to assist the researcher in using the data collected and benchmarking elearning based on andragogical principles in a contextualised setting. Through data analysis a framework will emerge. The next chapter will discuss the higher education scenario in South Africa and the important changes affecting education and in particular higher education.

Central University of Technology, Free State

3

CHAPTER THREE



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3.1 INTRODUCTION

In chapter one it was indicated that the aim of this study is to develop a framework and guidelines for elearning at a higher education institution in South Africa. In this chapter I will focus on the changes that have taken place in higher education in South Africa, because they have a direct effect on the proposed framework for elearning at TFS. Concepts that are central to the delivery of higher education and relevant to this study will also be discussed: these include open learning, distance education, resource-based learning, lifelong learning and flexible learning. The chapter concludes with a discussion of Outcomes-based Education and Training (OBET) as embodiment of the current philosophy underpinning education in South Africa.

South African education faces new challenges and demands, not only as a result of the new innovative technology available, but also due to its history and the educational methods, contents and aims it embraces. Open learning, flexible learning, distance learning and elearning are ways of overcoming barriers in education and empowering and reskilling learners (many of whom are adults). Recognition of prior learning must also be taken into account in building cost-effective educational interventions for alleviating the lack of skills and employment in South Africa (Roodt, 1999:58).

South Africa's higher education system has a tremendous capacity on which to draw in terms of research, teaching, and physical and human resources, yet inequities, imbalances and distortions arising from its history, but also from its present structure, hinder the system. Higher education can play a pivotal role in the reconstruction and development in South Africa, but to do so it must be reshaped to serve a new social order, meet pressing national needs and respond to new realities and opportunities (HSRC, 1996: [online]).

The South African Government embarked on an inclusive education and skills development system (training system) to fulfil its duty to basic education. This was done in accordance with Act 108 of 1996 (Rapport, 1999:11). The Act also makes provision for non-discriminatory and equal opportunities in education. The law further addresses the issues of inequality, injustices of the past and the improvement and delivery of quality education in South Africa (Rapport, 1999:11).

Incorporating all sectors in a national system, the National Qualifications Framework (NQF) has been developed to ensure that all educational providers will have a uniform standard against which to measure their qualifications. The NQF also makes provision for the qualifications to be obtained through building a specific qualification unit standard. Such units make up a qualification. Of importance is that units can be obtained at different institutions and still lead to a qualification if all required units are obtained. Recognition of prior learning is also taken into account when completing units that will lead to qualifications.

The National Qualifications Framework ensures that all qualifications are in line with international and national trends, and therefore these qualifications are recognised internationally and nationally (Rapport, 1999:11). To ensure that all qualifications are on par with the NQF's requirements, the South African Qualifications Authority approves all qualifications (NBI, 2002:8)(Olivier, 1998:25).

Quality indicators for the NQF would encompass these objectives in the following way:

- **Integration:** Quality and standards must integrate theory and practice, as well as skills, knowledge, values and attitudes. Integration would also be expected of policies, systems and practices of learning provision (learning, teaching and assessment, including programmes, materials, activities, etc.) leading towards qualifications and standards.
- **Learning outcomes:** Qualifications and standards would have to clearly state the expected skills, knowledge, values and attitudes to be acquired, as well as the level and standard expected of these in guiding learners and facilitators of learning. Learning provision would have to be designed in such a way that these standards are achieved.
- **Access, mobility and progression:** Qualifications and standards should be designed in such a way that they do not lead learners to a dead end, and also that they allow for continued learning and improved employment opportunities. Learning must be a process of building knowledge and skills.
- **Redress:** Qualifications and standards would have to ensure the recognition of the potential of citizens that were denied education and training in the past, so as to ensure the development of the individual and the social-political-economic environment of the country.
- **Personal and national development:** Qualifications and standards would have to ensure that learners are developed to such an extent that they can

accept responsibility for political-economic development and that of the country (Isaacs, 2000:3)(compare Olivier, 1998:11).

The NQF must attend to the following objectives in a holistic manner:

- Education and training must be brought together, since in the past education was seen as an area where knowledge is gained and training as an area where skills are acquired.
- Learning must be recognised, whether it takes place in a formal or informal setting.
- Learners must be able to move between education, training and working environments.
- Credits and qualifications must be easily transferable from one learning setting to another.
- The needs of the learner and the nation (incorporating industry) must be recognised and accepted nationally and internationally (Olivier, 1998:11).

In spite of the Government's efforts, South African education is indeed faced with enormous problems: the heterogeneous nature of the citizens and backlogs in educational shortages; mass education; and the financial implications of providing funds for all sectors in education. Furthermore, many institutions are not market related in their programmes or lack facilities. The private sector should get more involved (Smit, 1999:1).

The answer, according to Smit (1999:11), is to use technology (digital methods, the Internet, computer-assisted education, videoconferencing and all electronic devices available) to eradicate the backlog in the quality, effectiveness and efficiency of education. South Africa needs to get its house in order. Many overseas providers of education are targeting South Africa to provide qualifications of a high standard. Some South African providers are forming partnerships with overseas educational providers (Smit, 1999:11). Many bright and talented learners are trained and qualified locally but with international connections and are leaving South Africa for greener pastures. This in turn leads to a further backlog and a brain drain of future leaders and trainers in the formal and non-formal educational sector.

3.2 HIGHER EDUCATION IN

Several flaws and weaknesses mar the current higher education system in South Africa. Included are inequities, imbalances and distortions deriving from its history but also its present structures (NCHE, 1996:1)(Asmal, 2000:3).

The Education White Paper 3: A Programme for the Transformation of Higher Education, as well as the Higher Education Act, 1997 (Act 101 of 1997) provide the policy and legislative framework necessary for the transformation of the higher education system and also outline the role and functions of all concerned with higher education in South Africa (South African Yearbook, 2001:10 [online]).

Universities and technikons, which are autonomous in nature with councils fully responsible for their management, are the main suppliers of tertiary education. Technikons are more vocationally oriented to supply the labour market with workers equipped with particular skills and technological and practical knowledge. The demands placed on universities and technikons as role players in higher education have been on the increase since the Department of Education initiated the process of incorporating colleges into the higher education system in 1998, which served to bridge gaps in the system (South African Yearbook, 2001:11 [online]).

South Africa is increasingly becoming a world player, and globalisation and world market competitiveness have forced higher education systems to rethink and restructure. An ever-increasing demand for knowledge (including information technology), coupled with the high cost involved in gaining such knowledge, have forced higher education institutions to adapt traditional ways of thinking, and to bring their operations in line with current global trends (Du Plessis, 1997:1).

3.2.1 Recent changes in higher education in South Africa

South Africa's transition from apartheid to democracy has meant that existing higher education institutions have to be reviewed and rethought so as to lay the foundation for a learning society that can stimulate, direct and mobilise the creative and intellectual energies of all people towards meeting that challenge of reconstruction and development (RSA DoE, 1997:17)(Higher Education White Paper, 1998: [online]).

Higher education fulfils several different purposes in supporting the process of societal transformation, leading to a better quality of life for all:

- To meet the learning needs and aspirations of individuals through the development of their intellectual abilities and aptitudes.
- To address the development needs of society and provide the labour market with the ever-changing high-level competencies and expertise necessary for growth and prosperity in a modern economy.
- To contribute to the socialisation of enlightened, responsible and constructively critical citizens.
- To contribute to the creation, sharing and evaluation of knowledge (RSA DoE, 1997:17)(Higher Education White Paper, 1998: [online]).

However, despite acknowledged achievements and strengths, the present system of higher education is limited in its ability to meet all the diverse demands of the new South Africa, and is characterised by the following deficiencies:

- An inequitable distribution of access and opportunity for learners and staff along the lines of race, gender, class and geography.
- A chronic mismatch between the output of higher education and the needs of a modern economy.
- An unmatched obligation, which has not been adequately fulfilled, to help lay the foundations of a critical civil society that uses public debate and tolerance to accommodate differences and competing interests.
- An unacceptable number of institutions that observe teaching and research policies that favour academic insularity and closed-system disciplinary programmes.
- System-level governance characterised by fragmentation, inefficiency and ineffectiveness, with too little co-ordination, few common goals and negligible systemic planning (RSA DoE, 1997:17)(Higher Education White Paper, 1998: [online]).

Higher education must provide education and training to develop the skills and motivations necessary for national development and successful participation in the global economy. Internal restructuring is necessary to allow higher education institutions to face the challenge of globalisation and the breaking down of national and institutional boundaries, which removes the spatial and geographic barriers to access (RSA DoE, 1997:17)(Higher Education White Paper, 1998: [online]).

The economic and technologica e to several means through which higher education can contribute towards reconstruction and development, including:

- Human resource development characterised by the mobilisation of human talent and potential through lifelong learning.
- High-level skills training to strengthen South Africa's enterprises, services and infrastructure.
- Production, acquisition and application of new knowledge, which ensures a well-organised and vibrant research and development system that integrates the research and training capacity of higher education institutions with the needs of industry and social reconstruction (Higher Education White Paper, 1998: [online]).

The Ministry regards the following as fundamental principles that should guide the process of transformation in an open and democratic society:

- **Democratisation** characterised by mutual respect, tolerance, and the maintenance of a well-ordered and peaceful community life.
- **Development** through the production, acquisition and application of knowledge, the building of human capacity, and the provision of lifelong learning opportunities.
- **Quality** characterised by the evaluation of services and products against set standards, with a view to improvement, renewal or progress.
- **Effectiveness and efficiency**, which ensure that a system is operated without unnecessary duplication or waste, and within the bounds of affordability and sustainability by making optimal use of available means (subsequently also for distance education institutions).
- **Academic freedom**, which implies the absence of outside interference, censure or obstacles in the pursuit and practise of academic work.
- **Institutional autonomy**, which refers to a high degree of self-regulation and administrative independence with respect to learner admissions, curriculum, methods of teaching and assessment, research, establishment of academic regulations and the internal management of resources generated from private and public sources.
- **Public accountability**, which implies that institutions are answerable for their actions and decisions not only to their own governing bodies and the institutional community, but also to the broader society (RSA DoE, 1997:17)(Higher Education White Paper, 1998: [online]).

In line with goals set at national level, the following goals need to be pursued at institutional level:

- Transform and democratise the governance structures of higher education to provide for co-operative decision making while pursuing the common goal of a co-ordinated and participative politc and civil society.
- Encourage interaction through co-operation and partnerships between higher education institutions (such as Technikon Free State and the University of the Free State) and extending to all sectors of society.
- Promote human resource development through programmes that meet the social, political, economic and cultural needs of the country, as well as the best standards of academic scholarship and professional training.
- Establish an academic climate that encourages free and open debate, critical questioning of prevailing orthodoxies and experimentation with new ideas.
- Demonstrate social responsibility of institutions and their commitment to the common good through the provision of expertise and infrastructure for community service programmes.
- Build an institutional environment and culture based on tolerance and respect (RSA DoE, 1997:18 and Higher Education White Paper, 1998: [online]).

As agreed by all stakeholders in the higher education system, higher education will have to be planned, governed and funded as a single, coherent, national co-ordinated system.

"Higher education comprises all learning programmes leading to qualifications higher than the proposed Further Education and Training certificate or the current Standard 10 certificate" (RSA DoE, 1997:19 and Higher Education White Paper, 1998: [online]).

The envisaged programme-based approach is characterised as follows:

- Takes place in a multiplicity of institutions and sites of learning, using a variety of methods and attracting an increasingly diverse body of learners.
- Is fully compatible with all functions and integral components of higher education, such as learning and teaching, scholarship and research, community development and extension services.
- Will promote diversification of the access, curriculum and qualification structure within the National Qualifications Framework to encourage an open and flexible

system based on credit | multiple entry and exit points for learners.

- Will promote the development of a flexible learning system with a range of delivery mechanisms and support systems.
- Will improve the responsiveness of the higher education system to present and future socio-economic needs.
- Will require a system-wide and institution-based planning process and a responsive regulatory and funding system (RSA DoE, 1997:30 and Higher Education White Paper, 1998: [online]).

3.2.2 National Plan for Higher Education and the Higher Education White Paper

The National Plan for Higher Education aims to establish new programmes, discourage obsolete programmes, build new capacities, reshape the institutional landscape, and promote individual and institutional redress and equity goals. This plan will be developed by the Department of Education, while a statutory body known as the National Council for Higher Education (NCHE) will serve in an advisory capacity (NCHE, 1996: [online]).

The New Policy Framework of 1996 supports the Minister of National Education, Kader Asmal's, vision of moving into a global world and upgrading information and communication technologies (Asmal, 2000:3). To be successful in this vision, the transformation of such a framework demands the following:

- A single co-ordinated system that offers coherent qualifications recognised in terms of the South African Qualifications Authority Act, based on a comprehensive, development-oriented quality assurance system.
- A change and re-evaluation of all programmes and institutions.
- Increased participation by all stakeholders to address equity and development.

Learners must be allowed to access traditional contact institutions, but distance education and resource-based learning can play a major part in assisting learners to overcome barriers and be able to receive an education (NCHE, 1996: [online] and NCHE, 1996:12).

The National Plan proposes that irrespective of the balance in enrolments, the key is to ensure that all graduates are equipped with computer literacy, information management, and communication and analytical skills. Although the demographic

composition of the learner bo to reflect the composition of the population, equity of access remains a problem, as black and women learners are underrepresented in business, commerce, science, engineering and technology programmes, as well as postgraduate programmes in general, with black learners accounting for a larger proportion of dropout and failure rates than white learners (NCHE, 1996: [online] and NCHE, 1996:12).

To achieve the transformation goals of the White Paper, the higher education system must be differentiated and diverse, achieved through mission and programme differentiation based on the type and range of qualifications offered. Each institution's programme mix is based on its current programme profile, including the relevance of the profile to the institution's location and context and its responsiveness to regional and national priorities (NCHE, 1996: [online]).

As from 2003 new learner places in existing and new distance education programmes, including programmes offered as part of public-private partnerships, will only be funded if the programmes have been approved as part of the institution's plans (NCHE, 1996: [online]).

The National Plan proposes the establishment of a single dedicated distance education institution to address the opportunities presented by distance education, to be established through the merger of the University of South Africa and Technikon South Africa and the incorporation of the distance education centre of Vista University into the merged institution (NCHE, 1996: [online]).

According to the Higher Education White Paper (1998: [online]) the higher education system needs to change, and some specific deficiencies that exist are the following:

- An inequitable distribution of access and opportunity for learners and staff along the lines of race, gender, geography and class, as well as a disparity between the ratios of black to white, women to men, and the facilities available.
- A shortfall in the output of higher education for a modernising economy, with science, engineering, technology and commerce being areas of concern.
- A shortfall in the development of a democratic ethos, a sense of common citizenship and commitment to common good.
- A shortfall in academic achievement of international renown, as well as in the fulfilment of local, regional and national educational needs.

system based on credit | multiple entry and exit points for learners.

- Will promote the development of a flexible learning system with a range of delivery mechanisms and support systems.
- Will improve the responsiveness of the higher education system to present and future socio-economic needs.
- Will require a system-wide and institution-based planning process and a responsive regulatory and funding system (RSA DoE, 1997:30 and Higher Education White Paper, 1998: [online]).

3.2.2 National Plan for Higher Education and the Higher Education White Paper

The National Plan for Higher Education aims to establish new programmes, discourage obsolete programmes, build new capacities, reshape the institutional landscape, and promote individual and institutional redress and equity goals. This plan will be developed by the Department of Education, while a statutory body known as the National Council for Higher Education (NCHE) will serve in an advisory capacity (NCHE, 1996: [online]).

The New Policy Framework of 1996 supports the Minister of National Education, Kader Asmal's, vision of moving into a global world and upgrading information and communication technologies (Asmal, 2000:3). To be successful in this vision, the transformation of such a framework demands the following:

- A single co-ordinated system that offers coherent qualifications recognised in terms of the South African Qualifications Authority Act, based on a comprehensive, development-oriented quality assurance system.
- A change and re-evaluation of all programmes and institutions.
- Increased participation by all stakeholders to address equity and development.

Learners must be allowed to access traditional contact institutions, but distance education and resource-based learning can play a major part in assisting learners to overcome barriers and be able to receive an education (NCHE, 1996: [online] and NCHE, 1996:12).

The National Plan proposes that irrespective of the balance in enrolments, the key is to ensure that all graduates are equipped with computer literacy, information management, and communication and analytical skills. Although the demographic

composition of the learner bo to reflect the composition of the population, equity of access remains a problem, as black and women learners are underrepresented in business, commerce, science, engineering and technology programmes, as well as postgraduate programmes in general, with black learners accounting for a larger proportion of dropout and failure rates than white learners (NCHE, 1996: [online] and NCHE, 1996:12).

To achieve the transformation goals of the White Paper, the higher education system must be differentiated and diverse, achieved through mission and programme differentiation based on the type and range of qualifications offered. Each institution's programme mix is based on its current programme profile, including the relevance of the profile to the institution's location and context and its responsiveness to regional and national priorities (NCHE, 1996: [online]).

As from 2003 new learner places in existing and new distance education programmes, including programmes offered as part of public-private partnerships, will only be funded if the programmes have been approved as part of the institution's plans (NCHE, 1996: [online]).

The National Plan proposes the establishment of a single dedicated distance education institution to address the opportunities presented by distance education, to be established through the merger of the University of South Africa and Technikon South Africa and the incorporation of the distance education centre of Vista University into the merged institution (NCHE, 1996: [online]).

According to the Higher Education White Paper (1998: [online]) the higher education system needs to change, and some specific deficiencies that exist are the following:

- An inequitable distribution of access and opportunity for learners and staff along the lines of race, gender, geography and class, as well as a disparity between the ratios of black to white, women to men, and the facilities available.
- A shortfall in the output of higher education for a modernising economy, with science, engineering, technology and commerce being areas of concern.
- A shortfall in the development of a democratic ethos, a sense of common citizenship and commitment to common good.
- A shortfall in academic achievement of international renown, as well as in the fulfilment of local, regional and national educational needs.

- Fragmentation in the e ctiveness of governance in higher education, as well as too little co-operation between the providers of higher education and all other stakeholders (this is the fundamental problem that currently exists).

The Higher Education White Paper encourages effective learning environments whereby contact, distance, mixed-mode and dual-mode educational opportunities provide access to all learners (Higher Education White Paper, 1998: [online]).

3.2.3 The road ahead

The transformation of governance in South African higher education is a necessity, not an option. Higher education institutions are vital participants in the changes our society is undergoing and the challenges of the new world order. Our higher education institutions will only achieve their full potential once their system of governance reflects and strengthens the values and practices of our new democracy while charting and steering the development of a single, integrated national system of higher education (Higher Education White Paper, 1998: [online]).

Higher education is faced on the one hand with a socio-political demand for access from ever larger numbers of school leavers, especially from previously excluded population groups, and on the other with a socio-economic demand for highly trained person-power with wider ranges of skills and competencies (NCHE, 1996: [online]).

The prevailing reconstruction and development practices in South Africa will have a pronounced impact on higher education, with new research agendas and learning programmes being needed to mobilise the cultural, social and economic potential of the country and all its people (NCHE, 1996: [online]).

Emerging from a past of isolation, South African higher education is confronted with the reality of globalisation. As South Africa finds its place in the modern network of global exchanges and interactions, higher education will not only have to produce the skills and technological innovations necessary for successful economic participation in the global market, but will also have to socialise a new generation with the cultural values and communication competencies necessary in becoming citizens of an international and global community (NCHE, 1996: [online]).

Rapid international development ociety refers to the proliferation of knowledge and information in the contemporary world. New knowledge is shaping the structures and dynamics of daily life to an unprecedented extent. Lifelong and continuing education is a premium factor, with a growing array of public and private institutions ("non-specialised learning organisations") sharing in knowledge production with institutions of higher education (NCHE, 1996: [online]).

It is also clear that distance education and conventional education are now more closely linked than ever before. Assurances in the quality and delivery of distance education form the cornerstone of the way forward in addressing the transformation in higher education (SAQA, 2000:39).

Higher education is faced with the challenge of adapting to these changes and sustaining its role as a specialised producer of knowledge. Higher education institutions must seize the opportunity of becoming major generators of the power source that is knowledge (NCHE, 1996: [online]).

The Government is in the process of implementing its proposals for institutional mergers announced in the National Plan (RSA, 2003: [online]), which would result in a new institutional landscape. The implication of these proposals is that Technikon Free State, as a separate institution, will incorporate the Welkom campus of Vista University. The University of the Free State, as a separate institution, will incorporate the Bloemfontein campus of Vista University and the Qwaqwa campus of the University of the North (RSA, 2003: [online]).

The transformation of the higher education system is vital in the achievement of equity, and this transformation requires:

- Increased and broadened participation and a solid, equitable, efficient and effective system to ensure a larger and more diverse learner population.
- Responsiveness to societal interests and needs so as to ensure the establishment of a technologically oriented economy with the aim of fulfilling needs and ensuring a role in the global market.
- Co-operation and partnerships in governance through successful policy to ensure that all stakeholders can achieve their goals unhindered (Higher Education White Paper, 1998: [online])(HSRC, 1995:150).

The preceding discussion provid : recent developments in the higher education milieu in South Africa, as well as some pointers to the way ahead. In the following section central concepts featuring in higher education at present and which have a bearing on elearning are discussed. These concepts are important, as they underwrite the core principles of accessibility and removal of barriers to learners.

3.3 CENTRAL CONCEPTS IN THE PROVISION OF HIGHER EDUCATION

Since 1996, when the National Commission on Higher Education proposed an open learning perspective to assist in the country's education problems, many distance education institutions have changed their learning programmes to assist in this process. Open learning is a new concept included in the process of education. It focuses on education being more open and increasing access to learners by removing all unnecessary barriers to learning. Simultaneously it also provides learners with a reasonable chance of success in an education system centred on learners' specific needs, located in the multiple arenas of learning (SAIDE, 1997:4).

Universities as social institutions are most tenaciously resistant to change. Some old habits of lecturers, including the use of overhead projectors, chalkboards and printed material, have been in use for decades. Modern information technology tools are now forcing institutions to "adapt or die". Universities are also now seeing the benefits, not only financially but also academically, of providing learners with such technologies (Klemm, 1999: [online]).

3.3.1 The philosophy of open learning

The National Council for Higher Education defines open learning as follows:
"A flexible, learner-centred approach to education, seeking to increase access to educational opportunities by removing all unnecessary barriers to learning. This involves using the full spectrum of available resources to ensure quality and cost effectiveness in meeting diverse educational needs, including preparation of the widest possible range of learners for the process of lifelong learning" (NCHE, 1996: [online]).

The main aim of open learning falls within the parameters of the National Plan for Higher Education in South Africa (Morrow, 1996:4).

Open learning is an approach to education that seeks to increase access to education by removing all unnecessary barriers to learning. Furthermore, it also aims to provide

learners with a reasonable char education. Therefore the focus of open learning is centred on learners' specific needs and is located within the many areas of learning and training in an education system (SAIDE, 1997:4).

Johnson (1990:4) gives us a clear definition of open learning. He views open learning as an approach rather than a system or technique. It is based on the needs of individual learners, not the interests of the teacher or the institution. It gives learners as much control as possible over what, when, where and how they learn. It commonly uses the delivery method of distance education and the facilities of educational technology, and it changes the role of a teacher from a source of knowledge to a manager and facilitator of learning.

Since open learning has paved the way for new technologies to be incorporated and for learners to be given control over their studies, lecturers have had to change and adapt to their new roles as managers and facilitators. An open learning approach accommodates such diversity, as learners can personally negotiate relevant goals and follow individual learning pathways and timeframes to achieve goals set by themselves. In traditional education, different learning styles and needs amongst learners are often overlooked in the design, production and delivery of learning to learners. Open learning encourages independence and autonomy in learners, as learners take control and are actively involved in the learning process. Empowerment of learners increases the potency and relevance of their own learning (Marland, 1997:70).

Key principles in open learning include the following:

- **Learner centredness:** Learners should be the focus of the educational process. Learners should construct their own lifelong career of learning.
- **Lifelong learning:** Learning should continue throughout life. In an ever-changing and technological world, learners should stay in touch as globalisation changes the world in which we live.
- **Flexibility in learning:** The needs of learners should be considered by making learning more flexible to accommodate learners.
- **The removal of barriers hindering accessibility to learners:** The use of pedagogical approaches must be removed so as to improve accessibility to learning and expertise (Marland, 1997:70)(compare SAIDE, 1997:4).

Open learning, according to the University of the Free State (ISHE, 2001:4)(compare SAQA, 2000: [online]), is a means of incorporating new ideas into learning and has as

its goal the improvement of a egarding learning. Open learning enhances the effectiveness or efficiency incorporated within a programme through the use of all learning resources in its mission and goals. These resources include textbooks, audiovisual material, computers, group work and projects, to name but a few. Methods used to ensure success in learning are not restricted in open learning.

Open learning is therefore based on the principles of:

- A learner-centred approach
- The supply and provision of access to learners (not only those on campus)
- Giving learners a choice insofar as time, place and pace of learning is concerned (ISHE, 2001:4).

Open learning, as opposed to distance education, does not inhibit learner choices regarding content, but emphasises higher learning choices. Open learning is not an ideal method of learning, simply because no ideal method of learning exists. The most important aspect of open learning is its openness towards learners. Resource-based learning is the term used by the University of the Free State to refer to open learning. Most importantly, learners should change their traditional approaches and move from a teacher-centred approach to a more learner-centred approach. The latter is a central focus of the South African Government's plan for higher education (ISHE, 2001:5).

Open learning provisions go hand-in-glove with the establishment of new technologies in education. A vehicle in the provision of open learning programmes is distance education.

3.3.2 Distance education

Distance education has always been a commodity that was seen as just a way to help a poor few to receive their degrees in a non-traditional manner. However, a new approach and a need to restructure higher education have been set in motion, despite public policy and politics. Distance education is seen not only as a way to reach more learners, but also as a means of empowering and enhancing institutions towards their own prestige and research capabilities (Marland, 1997:70)(compare SAIDE, 1997:4).

The most significant benefit of distance education is that it is not constrained by time and place. With new technologies such as the Internet, complete and full courses can now be presented to learners anywhere (Klemm, 1999: [online]).

The White Paper on Higher Education (which promotes transformation) states the importance of increased provision of distance education and resource-based learning. The concept of open learning to meet current challenges and provide greater access to learners falls within the parameters of such provision, but with enhanced quality in a context relevant to resource constraints and a diverse learner body. A significant increase in learner numbers is being experienced in distance education and resource-based learning programmes. This is an eye-opener for South Africa, as many foreign companies and educational enterprises target South Africa. Research has shown that not all distance education providers are equal insofar as quality and delivery of programmes are concerned. The efficiency, appropriateness and effectiveness of programmes are cause for concern (Centre for Educational Technology and Distance Education, 1999:3).

Numerous distance education providers exist in South Africa. The White Paper on Higher Education encourages contact and distance education providers to provide effective learning environments whereby contact, distance, mixed-mode and dual-mode educational opportunities are elements used in the provision of access to all learners (Centre for Educational Technology and Distance Education, 1999:3).

Distance education is the quasi-permanent separation of teacher and learner for the duration of the learning process. It does not imply that no contact occurs between lecturers and learners. The major teacher is, however, courseware material mediated through various technologies, rather than a speaking teacher. A benefit is that no restriction is placed upon the time and place of delivery. Distance education removes barriers and increases choices and access to educational providers (Keegan, 1986:49).

To illustrate and facilitate the implementation of distance education programmes, criteria for quality and distance education were set. The criteria focus on programme development, course design, course material development, services to and responsibilities of learners, learner support including factors and mentors, assessment, language of teaching and learning, as well as internal and public communication, human resource strategy, finances, fees and payment regulations, quality assurance and review, evaluation and research, marketing, accreditation and collaboration (Centre for Educational Technology and Distance Education, 1999:11).

There is, however, a serious educationists regarding distance education. Simply put, by extending a lecture hall through the mass production of audio and videotapes and compact discs (CD-ROMs) and use of the Web, the quality of education will be diminished. A high degree of interactivity also increases professor workload. Interaction between tutor, teacher or lecturer and learners is also minimised as more and more technologies are used. Another concern is that the greater the number of learners involved in distance education programmes, the greater the number of chances that are needed. Tuition fees have escalated substantially and quality has already declined as a result. Extra funding is needed to ensure that quality does not suffer further. An option would be to allow universities to specialise in order to be more effective and to minimise costs. The few programmes that would be offered would be of a high quality. Universities, business and stakeholders would have to co-operate in minimising duplication and sharing educational resources, including facilities and courses. Another concern is that many lecturers are not yet ready and do not possess the skills necessary to facilitate these processes. Lecturers' skills have to be upgraded. With the new plan and transformation in higher education more distance education and adult learners will be entering universities. Quality is vital, and by incorporating instructional technologies, opportunities will open for quality education to be delivered via distance education or on site (Klemm, 1999:3 [online])(compare SAQA, 2000: [online]; NCHE, 1996: [online]).

3.3.3 Resource-based learning

Another important concept related to trends in the delivery of higher education in South Africa is resource-based learning. The NCHE (1996: [online]) report defines resource-based learning as:

"The increasing use of a variety of media methods and mechanisms to meet the different needs of learners in a rapidly changing educational situation, with diminishing dependence on face-to-face communication and a growing reliance on well-designed interactive study material, the implementation of computer-based and audiovisual instruments and programmes, and diversification in the manner and location of educational guidance and support offered to learners by teachers."

Increased support to learners signals a collapse of the traditional sharp distinction between contact and distance education (Morrow, 1996:9).

Resource-based education can perior form of teaching to content-based teaching. A much more open approach improves the continuous education of learners through a shared and collective approach nestled in reflective professional judgement. Hence the traditional institutional boundaries are opened and the full spectrum of available educational resources is utilised (NCHE, 1996: [online]).

As a result, a learner or educator can share cross-institutional (system-wide) co-operation, the accessibility of the professional, and the academic skills of the most talented in education (Morrow, 1996:9).

There are significant barriers to learner access and success at traditional contact institutions, which can be reduced by means of distance education and resource-based learning. This requires appropriate methods to encourage and reward the development of quality resource-based courses and course materials and to ensure their wide distribution and availability. Institutions will have to foster a co-operative and co-ordinated approach (NCHE, 1996: [online]).

The development of resource-based learning means that the quality and success of teaching need not depend upon staff levels rising in tandem with increased enrolments. Better use can be made of scarce and costly resources, scholarship and teaching expertise (NCHE, 1996: [online]).

Resource-based learning is particularly appropriate for learners who are already in employment or who need to earn a living in order to cover study costs. Many of these learners are in possession of prior learning and experience of an unconventional kind, and resource-based learning providers are the ideal institutions to pioneer the evaluation of prior learning and experience for access purposes (NCHE, 1996: [online]).

Resource-based learning can expand easily in the existing infrastructure in both the public and private sectors. However, this would require additional investment, especially in learning technology, staff development and learner support. Many institutions are still far from meeting their major transformation requirements in refocusing institutional missions, modernising courseware, improving learner support and undertaking essential efficiency reforms and cost-effective planning (NCHE, 1996: [online]).

The Ministry acknowledges the establishing a national network of centres of innovation in course design and development to enable the development and franchising of well-designed, high-quality and cost-effective learning resources and courses by building on the expertise and experience of top-quality scholars and educators around the country (NCHE, 1996: [online]).

Contact as well as distance education institutions will have to provide effective and flexible learning environments on a continuum of educational provision to allow educators to select from an expanding range of educational methods and technologies that are most appropriate to the context within which they operate (NCHE, 1996: [online])(Strydom, & Van der Westhuizen, 2001:16).

Resource-based learning approaches have the potential to integrate lifelong learning into the basic shape and structure of higher education. The Ministry of Education is committed to the development of new teaching and learning technologies, especially through its technology-enhanced learning initiative, known as TELI (NCHE, 1996: [online]).

An investigation should be launched into the viability of a coherent national framework for facilitating distance education and resource-based learning, including a comprehensive audit of existing public and private distance education and resource-based learning provision in order to assess strengths and weaknesses. The Ministry will appoint a task team to conduct this investigation in collaboration with the NCHE, with the outcome being a clear agenda for improvement, and guidance on future policy, planning and investment (NCHE, 1996: [online])(Strydom & Van der Westhuizen, 2001:17).

Resource-based learning could take place at any institution, but the difference between contact tuition and resource-based education is situated in the role and function of the teacher. The teacher acts as facilitator in the learning process by motivating the learner to study independently and to use the facilitators to open up resources and facilitate the learning process. The teacher does not act as sole source of knowledge or information supplier (Centre for Educational Technology and Distance Education, 1999:6).

3.3.4 Lifelong learning

Lifelong learning has become a key concept when considering education and training worldwide. With the extraordinarily rapid pace of change and globalisation in the world, a need has developed for people who are adaptable and responsive, i.e. who are capable of lifelong learning. It is particularly important for the South African higher education system to cultivate lifelong learners and to provide for continuing education throughout life (RSA, 2003: [online]).

Lifelong learning is cross-sectoral in that it is not limited to formal education but includes adult and community education and workplace-based learning, together with access to libraries and electronically transmitted and stored data. This type of learning embraces all types and levels of learning irrespective of its content, form or location (RSA, 2002: [online]).

However, in the education policy documents in various parts of the world, lifelong learning has become "policy speak", which assumes multiple meanings and interpretations. On the one hand it is employed as a conceptual framework that presents a comprehensive and particular understanding of educational priorities and the associated strategies, and a fundamental assertion of a radically different and distinct pedagogy. On the other hand, it can be more simply expressed as emphasising the temporal plane, making education available throughout the lifecycle. This latter definition allows no explicit focus on pedagogy, as the main emphasis is on expanding the present educational provision. South African policy documents refer to both the comprehensive and simple usage of the concept of lifelong learning (RSA, 2003: [online])(Isaacman, 1996:33).

Lifelong learning is integral to the struggle for substantive democracy and social justice in South Africa. People cannot be stopped from learning in their everyday lives, but the quality of the learning provided is extremely uneven. In many policy documents lifelong learning is used as an overarching framework or goal for learning and teaching. The various new policies and practices being implemented in the South African educational system can be seen as building blocks towards a lifelong learning system. Lifelong learning as a concept is visionary and therefore poses profound pedagogical and organisational implications that are yet to be explored and fully understood (RSA, 2003: [online])(Isaacman, 1996:33).

Focus must continually be shif individual and the context of that individual, with neither point being separated from the other. An individual comprises a human being, but also a worker and a citizen of a country, with each individual having his/her own social context. The role of lifelong learning in these contexts has varied throughout history, with it having addressed the needs of production (worker), society (citizen) and culture (human being) to varying degrees at different times (RSA, 2003: [online]).

Lifelong learning exists in all societies in different forms as people move through their life stages. There are many "lifelong educations", as lifelong learning refers to the totality of learning activities, with these being classified by Paul Belanger into three specific constituent elements:

- **Initial education:** Those individuals who participate more in learning activities during different periods of adult life are those who had a better and longer initial education, since the general cumulative pattern of educational participation is highly influenced by initial education.
- **Adult education:** There has been a rapid expansion of the social demand for organised adult education over the past 20 years, including vocational, community and higher education. The provision of adult education does not conform to an organisational pattern, but is rather diffused over many structures and arrangements (compare 5.3).
- **Diffuse learning environments:** Learning does not take place only through organised educational, formal or non-formal processes – there are also numerous informal learning events and processes. Various cultural factors influence educational aspirations and learning achievement in initial education as well as adult education, including attitude towards education, the predisposition towards specific types of learning in the family or immediate environment, the mere availability of books, the prevailing attitudes towards written communication, and the presence of a local cultural infrastructure (RSA, 2003: [online])(Isaacman, 1996:31).

3.3.5 Flexible learning

A mixed mode of education (as preferred by Technikon Free State at its respective regional learning centres) is where the same learners, often within a single programme, receive combinations of contact tuition, resource-based learning and distance education. Dual-mode institutions offer programmes by using either distance

education and/or contact tuition, tion. Only certain programmes are offered through distance education and sometimes for individual categories of learners. Flexible learning enables learners to access learning through various learning methods and opportunities aided by a removal of barriers by giving freedom of access, pace, place and time. Mass learning is a key element in flexible learning. More and more "traditional" or face-to-face institutions are being challenged by the global market to provide quality distance education (Centre for Educational Technology and Distance Education, 1999:8)(compare Ryan, Scott, Freeman & Patel, 2000:30).

Technologies and methods form part of this process to deliver such programmes (Centre for Educational Technology and Distance Education, 1999:6). As a result, the South African Qualifications Authority Act and the National Qualifications Framework were implemented to ensure that all institutions register, adapt, plan and design their programmes within the framework and new transformation milieu in higher education. Skills, attitudes, values and knowledge form the basis of outcomes to be achieved by the learner. These outcomes are assessed within the design of programmes that have to be registered with the South African Qualifications Authority. Obviously all distance education providers have to register all programmes so as to eliminate duplication of programmes, and they must set national standards to ensure quality and also international recognition and accreditation of programmes that are either "face-to-face" or distance educational in nature (Centre for Educational Technology and Distance Education, 1999:8)(compare SAIDE, 1997:15).

As part of establishing an andragogical framework for elearning the concepts of open learning, distance education, resource-based learning, lifelong learning and flexible learning were discussed. Again, learning stands central and the adult learner is targeted in order to establish the framework. In elearning all the above concepts have to be included to benchmark elearning, as they are not only required by law but have similarities with andragogy and elearning (compare chapter three) and are essential in the establishment of a framework.

3.4. OUTCOMES-BASED EDUCATION AND TRAINING (OBET)

3.4.1 Definition of OBET

Outcomes-based education and training focuses on the learning outcomes to be achieved, with learning programmes being designed to help learners achieve those desired outcomes (Olivier, 1998:30).

William Spady, who is regarded as the leading advocate of OBET, defines OBET as a "comprehensive approach to organising and operating an education system that is focused on and defined by the successful demonstrations of learning sought from each learner." He goes on to define outcomes as "clear learning results that we want learners to demonstrate at the end of significant learning experiences" and "actions and performances that embody and reflect learner competence in using content, information, ideas and tools successfully" (Spady, 1994:2). With regard to the OBET paradigm, Spady (1994:8) states that "...WHAT and WHETHER learners learn successfully is more important than WHEN and HOW they learn something" (Malan, 2000:22).

3.4.2 Characteristics of OBET

Outcomes-based education and training is characterised by the following:

- Outcomes and assessment criteria are clearly tasked in the standards or the syllabus.
- Outcomes focus on skills, knowledge and attitudes/values.
- Learning, which is facilitated, can take place anywhere (it is not restricted to formal learning).
- Critical cross-field outcomes as well as specific outcomes are included in the assessment.
- Outcomes are descriptive of observable, demonstrable and assessable performance.
- Outcomes are broad in scope and are not merely a list of specific tasks or skills.
  (Assessment College of South Africa, 2003:41)(compare Malan, 2000:22; Olivier, 1998:32)

The following are distinctive features of the current OBET approach:

- **It is needs driven**, with curricula being designed in terms of knowledge, skills and attitudes expected from graduates and aiming to equip learners for lifelong learning.
- **It is outcomes driven**, with a line extending from taking cognisance of training needs to setting an aim (purpose) for the programme and goals for syllabus

themes and learning outc assessing the learning outcomes in terms of the set learning objective.

- **It has a design-down approach**, with learning content only being selected after the desired outcomes have been specified. Content is a vehicle to achieve the desired learning outcomes.
- **It specifies outcomes and levels of outcomes**.
- **The focus shifts from teaching to learning**. Where a learner-centred learning approach is maintained, study guides help the learners to organise their learning activities, while group work, continuous assessment and self-assessment are major features.
- **The framework is holistic in its outcomes focus**, with grass-roots learning objectives being linked to goals and aims at higher levels – thereby providing building blocks for achieving higher level outcomes (Assessment College of South Africa, 2002:41)(compare Malan, 2000:32; Olivier, 1998:32; QPD Consultants, 2002:26, section 2).

3.4.3 Underlying beliefs of OBET

Outcomes-based education and training is based on the following principles:

- Learners must be encouraged and permitted to learn to their full potential.
- Success breeds success, and learners will build self-confidence as they progress.
- The learning environment must promote conditions under which learners can be successful (Assessment College of South Africa, 2002:41).

Outcomes-based schools have a philosophical base that embraces the following points as mentioned by Mamary (1991) in Killin (2000:3):

- All learners have potential, and schools and educators should develop it.
- Schools should pursue all avenues for learners to succeed rather than find ways for them to fail.
- Co-operation and mutual trust drive all outcomes-based schools.
- Excellence is for all learners, not just a few.
- By ensuring that learners are thoughtfully prepared every day for success the following day, the need for correctives will be reduced.

- Learners should collabor her than compete, as co-operation and communication ensure success in life.
- Insofar as is possible, no learner should be excluded from school activities.
- A positive attitude and motivation will ensure that every learner will learn well if he/she believes he/she can.

All OBET principles are based on two types of outcomes within an education system and are **measured by performance indicators** (such as test results, completion rates and post-course employment rates), whereas a learner's knowledge, his/her ability to perform skills and the applicability of his/her knowledge to his/her performance are secondary outcomes. All educationalists consider the knowledge, skills, values and attitudes of learners as being what OBET stands for (Killen, 2000:1).

OBET is a theory of education, or a systematic structure for education, or a classroom practice. In short the learning experiences and success in the learner's performance are key elements of OBET. OBET focuses on the learner and the curriculum, instruction and assessment, and ensures that this learning ultimately occurs. OBET is therefore an approach to planning, delivering and evaluating instruction by means of educators, learners, parents and administrators, who must focus attention and efforts on the desired results of education. There are two approaches to OBET, namely one that focuses on traditional subject-related academic outcomes (subject specific) and one that focuses on cross-discipline outcomes (problem solving, co-operative work), with the former being known as traditional/transitional OBET and the latter being known as transformational OBET (Killen, 2000:1).

The question is asked whether replacing the previous system of education with an OBET approach constitutes an educational paradigm shift. Are OBET and its philosophy and practice so different that it can be promoted as such (Malan, 2000:24)? When one considers Mouton's (1996:204) definition of a paradigm as "a collection of mutually accepted achievements (including the theories, exemplary solutions, predictions and laws)...In this sense, a paradigm is primarily a model for conducting normal research..." then the answer is no.

There is as yet no collection of mutually accepted achievements in terms of new theories on OBET, and also no exemplary solutions to the challenge of total intellectual and potential development of learners. Predictions of the value of OBET have not been proven, and laws validating OBET as an acceptable practice and construct are

not apparent. This means that th ı base to verify the claims of OBET, and therefore it cannot be considered a paradigm shift (Malan, 2000:24)

Spady (1994:94) does, however, characterise OBET as a systems transformation approach. In doing so he identifies ten key components that underlie OBET as a transformational approach, namely: outcomes defined, expanded opportunities for learners, performance "credentialing", concept integration, instructional coaching, culminating achievement, "inclusionary" success, co-operative learning, criterion validation, and collaborative structures (Spady, 1994:36).

The major differences between the traditional content-based approach to learning and the new outcomes-based approach to learning can be summarised in table 3.1:

TRADITIONAL CONTENT-BASED LEARNING	**OUTCOMES-BASED LEARNING**
Rote learning	Critical thinking and reasoning
Learners mainly passive when exposed to content	Learners active and involved in the learning process
Little communication	Communication critical
Content-driven syllabus broken down into subjects	Learning, which is outcome and process driven, is connected to real-life situations
Textbook/worksheet bound	Learner and outcome centred
Teacher centred	Teacher is facilitator
Syllabus considered to be accurate and non-negotiable	Learning programmes seen as guides
Emphasis on what the teacher hopes to achieve	Emphasis on outcomes (what the learner achieves)
Curriculum development process not open to the public	Wider stakeholder involvement encouraged

Table 3.1 Traditional learning as compared to outcomes-based education and training (adapted from Olivier, 1998:102).

The most important aspects of teaching in OBET are the following:

- *Learning* rather than teaching.
- Learners need to *think.*

- Processes that engage le ontent, as well as the *content itself*, facilitate thinking.
- *Links* should be forged with other fields of education/subjects, as subjects never exist in isolation.

The teacher's/lecturer's *responsibility* is to equip learners with the skills necessary to enable them to perform effectively and to help learners *learn* how to *learn* (Olivier, 1998:102).

3.5. RECOGNITION OF PRIOR LEARNING (RPL)

Recognition of prior learning is a process which, through assessment, gives credit to learning that has already been acquired in different ways, e.g. through life experience (Isaacs, 2000:6)(compare QPD Consultants, 2003:2, section 3).

In the recognition of prior learning experiences, accreditation should take place, while terms such as "learned", "knowledgeable" and "competent" require institutions to be transparent in their admission requirements for accountable learners. The ability to accumulate credits earned in the sum of different learning contexts, which will lead to the achievement of national qualifications, forms part of the new openness in education (SAIDE, 1997:4; Assessment College of South Africa, 2003:42)(compare QPD Consultants, 2002:2, section 3).

The objectives of the National Qualifications Framework include the need to facilitate access to, and mobility and progression within education, training and career paths, as well as the need to accelerate the redress of past unfair discrimination in education, training and employment opportunities. SAQA is faced with the challenge of finding a way in which these two objectives can be met, while at the same time finding a way to recognise the learning that has taken place outside traditional learning contexts (previously the only learning contexts that were formally recognised). SAQA intends to engage its structures in the area of RPL as a means of giving practical meaning to these objectives (SAQA, 2000: [online])(Isaacman, 1996:18).

The concept of RPL includes but is not limited to learning outcomes achieved through formal, informal and non-formal learning and work experience (SAQA, 2000: [online]) (compare QPD Consultants, 2002:4, section 3). It is important to take note of recognition of prior learning, as many learners engaged in elearning and studying at

higher education institutions ar PL thus has to be included as a benchmark in an elearning framework (Isaacman, 1996:18).

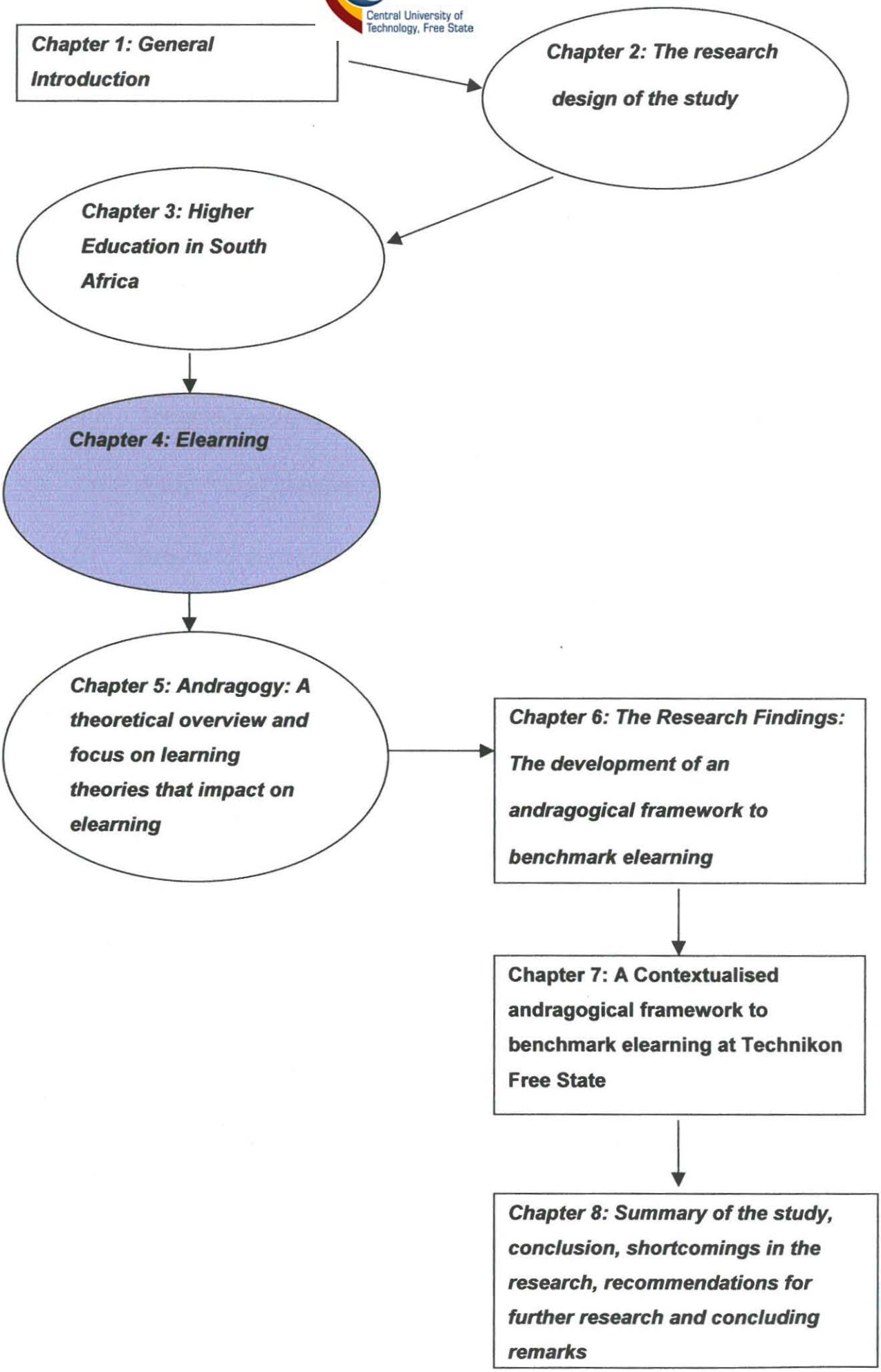
3.6 SUMMARY

In this chapter I have attempted to outline the framework of education in South Africa, in order to show where and how changes are taking place in higher education. This chapter serves as a basis for identifying guidelines, as it contains the laws (according to Government) that act as frame in the development of any learning material and/or programmes for higher education and elearning. The central concepts and approaches discussed in this chapter also serve as pointers for the further discussion of elearning within a higher education institution in South Africa. The subsequent chapter will focus on elearning and its theoretical underpinnings that will be used to establish and design the proposed andragogical framework to benchmark elearning at Technikon Free State.

Central University of Technology, Free State

4

CHAPTER FOUR



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4.1 INTRODUCTION

"Technology is transforming the ways we learn. Technology is freeing the individual from institutional, physical and time constraints: permitting both personnel and collaborative learning" (Moore, 1984:12).

Technology is transforming distance education through information and instructional technology (Gordon, 2000:5). The major benefit is that the classroom and lecturer can be brought to the learner in his home. Lecturers can communicate synchronously by means of online materials. As elearning courses increase and improve so does the learning and teaching methods used, which, in turn, facilitate the learning process. By opening up educational opportunities to learners, all educational providers become globally competitive, and institutions with below standard courses or materials will decline. In distance education, quality of instructors and instructional methods should embrace a smooth delivery system, an organised administrative support system and a method of instructional support.

Although efforts have been made to stop the global trend, it would be far wiser to "embrace all opportunities to expand the scope, quality and international competitiveness of higher education in South Africa" (Gordon, 2000:5). Eagar (1996:18) explains that South Africa should embark on elearning as quickly as possible in order to stay in touch with countries like the USA, Japan, Malaysia and Singapore. A new learning paradigm should be followed where openness exists in providing access to learners. South Africa needs a holistic, participative and ongoing integrated education system. Action-based, experiential and in-context learning should complement or even replace traditional approaches.

This chapter focuses on elearning and the technologies and tools needed to successfully deliver elearning. It is important to understand how elearning and distance education are related in the delivery of education at a distance. Elearning is ideally suited to the delivery of education, as it has a multitude of technologies available. In addition elearning can serve learners on and off campus, making delivery possible in own their time, and at their own place and pace, especially for adults. The essential characteristics of elearning are discussed, because these will form the benchmarks

needed to establish the propose FS. As a first phase of discussing elearning, the next section focuses on the relationship between elearning and distance education in higher education.

4.2 ELEARNING AND DISTANCE EDUCATION IN HIGHER EDUCATION

Elearning is a fairly new concept in education. As mode of educational delivery it is the central focus of the researcher's investigation. The researcher will therefore provide a detailed discussion of elearning within the context of distance and higher education. In light of the fact that this study aims to provide a theoretical framework for the benchmarking of elearning at TFS, the higher education context for elearning will also be discussed.

4.2.1 Classification of relevant concepts

In order to understand how elearning functions in an educational setting we need to understand where and how elearning is applied and used. As elearning is a subset of distance education, a point of departure would be to see how elearning, distance education and higher education are interrelated.

4.2.2 The nature of distance education

"Distance education describes an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner." In practice a combination of media, including face-to-face tutorials, printed study materials, television, telephone and other media, are used to assist learners to study at home, at work, or at centres that serve as host to the place of study. Distance education is done either for credit purposes or towards studies of the self (Media in Education and Development, 1997:11). Distance education refers to teaching and learning situations where learner and instructor are geographically separated. Distance learning is bi-directional between learner and instructor (Du Plessis, 1997:1).

Distance education should be a joint venture to ensure success. Educational authorities must ensure legitimacy, financial support and accreditation. The inter-institutional collaboration should include technological and educational media and material. This will result in improved quality distance education and accessibility to higher education. Many regard distance education as the sole means of upgrading and getting results. Distance education also acts as provider of lifelong learning and links

the private sector, institution of e rnment as a holistic force to combat educational backlogs in the current educational system. Co-ordination, co-operation and an integrated approach should ensure quality distance education (Eagar, 1996:18).

The NEA (2000: [online]) describes distance learning as instruction that takes place when learners and faculty are in different locations. Web-based courses account for 44% and video technologies for 54% of enrolment. The distinction between distance learning and elearning is not clear, since distance education can also incorporate many technologies like video-conferencing, compact disc (CD-ROM) and live broadcasting, which also form part of elearning (or web-based education). Email remains the dominant means of communication.

Another development in distance education is accessibility to learners. "An open learning system removes barriers of geographical isolation and personal educational barriers and assists people to learn at any time, place and pace that satisfy their circumstances. The widest possible range of teaching strategies includes independent and individualised learning to suit the learner" (Media in Education and Development, 1997:11). Tertiary level training uses this method specifically in distance education and adult education.

Technology is now playing a new role in the facilitation of distance education. Where learners are located across a wide area, technology can be used to take the instructor and instructions to the learner. The end result is that any learner with a computer and relevant software can now access worldwide education and resources. Several universities and educational institutions have embarked on this venture to attract learners (Media in Education and Development, 1997:120).

Having explained what distance education is, the next section will discuss the central focus of this investigation: the nature of elearning.

4.2.3 The nature of elearning

Although the term elearning is widely used, a clear definition is not readily available. The researcher will therefore explain how elearning is viewed in general and will conclude with his own perception of elearning. Although researchers use different terminology for elearning (e.g. telelearning, online learning, Web-based learning and computer-based education) the researcher prefers to use the term elearning.

Elearning is a very broad term earning that uses electronic media incorporating Web-delivered courseware, compact disc (CD-ROM), video-conferencing and low-tech deliveries like audio and video (Ellis, 2001: [online]). Porter (1997:13) views elearning as having more advantages than distance education as it can adopt all the advantages of distance education and also provide media-rich environments to the learner. Blass (2002:5) describes elearning as the application of advanced information technology – especially the Internet.

Cadtrain (2002: [online]) describes the following characteristics of elearning:

- Content available at any time.
- Content accessible by the learner anywhere in the world.
- Learner-centred environment to suit the personality of the individuals or organisations.
- Some form of technology is used for learning.
- Learning is network assisted either by LAN (Local Area Network) or WAN (Wide Area Network).
- The whole learning experience, from assessment to testing, takes place through computer usage.

Elearning/telelearning and online learning have similarities but differ in some respects. Definitions in literature are vague. Elearning refers to all electronic delivery of courses, including all multimedia, interactive television and video-conferencing. In short, all applications, methods and means of electronic education, and anything that uses electricity or something electronic in nature to educate can be regarded as elearning (UP, 2001:1).

Online learning is narrower in scope and refers mainly to teaching and learning via the WWW, complemented by Internet services such as FTP and email (Schulze, 2000a:25). Telelearning is "making connection among persons and resources through communication technologies for learning related purposes" (Collis, 1996:9). This definition is vague. Du Plessis (2001: [online]) defines telematic education by explaining that *tele-* means "over a distance" and *-matic* means "by means of". Telematic education focuses more on the way in which education can take place, and less on the technologies available to deliver education.

Ellis (2001: [online]) sees elearning as just another term for online learning. The major difference is that elearning is a "catch-all tag" that includes any learning that takes

place using digital media as o -face classroom teaching. Online learning is learning that covers any learning with an online learning component

Monare (1999:8) views electronic education as two pronged – employing both computer-based multimedia and the Internet. Elearning is much cheaper and many courses are offered to learners who are off-campus. According to Van Wyk (Rapport, 1999:11) elearning is the opening up of opportunities to masses of people at a fraction of the cost. Learners are assisted as if they are attending full-time courses on campus. Different types of technology, such as satellite broadcasts, video and interactive group discussions, are used to make education more available, affordable and controllable. All qualifications obtained are fully credited with the Department of Education. Van der Merwe (2000:18) states that the needs of learners are met as elearning offers an effective and flexible environment for learning. A range of methods and technologies are used to assist the learner.

In summary, the researcher views elearning as a combination of all devices available that make use of electricity or electronics to deliver education to anyone that connects to such a device, whether synchronously (in real time or "live") or asynchronously (delayed). The researcher's definition includes any form of technology that has the ability to educate. The manner in which any electronic device is employed to educate or deliver knowledge to any learner depends upon the ability, expertise and educational make-up of the educator. The only difference lies in the use of the various electronic devices available to facilitate the educational process.

4.2.4 The relationship between elearning and distance education

Distance education and especially elearning are rapidly growing phenomena. Elearning paved the way for adult learners to engage in lifelong learning. Elearning enabled rural inhabitants to continue with their everyday lives while improving their qualifications at a university or institution of their choice. The rationale of choosing to study at a distance is rooted in the adult versus the younger learner. While the younger learner is driven by ambition, adults study to improve their qualifications in order to provide an income for their families.

The difference between traditional or classroom education and distance or electronic education is that the latter does not depend on providing lecturers, buildings or classrooms. Facilities as such do not automatically provide quality education (Gordon, 2000:5).

The key element that ensures s e education is learner support. This can be achieved by providing good learning materials or study guides, access to tutorial support, library and learning resources, and environments for learners to practice and apply their knowledge gained through learning (Gordon, 2000:5).

Electronic delivery is complicated because it needs to be interactive and accessible. In addition Binedell (as cited in Business Day, 2001:10) states that elearning should be seen as a supplement to, and not as a substitute for, classroom-based learning. The essential elements in the success of elearning are previous exposure to study and regular interaction with lecturers and other learners. Previous correspondence courses have been modernised by means of technologies that were not available before and are delivered electronically via the computer.

It is clear that technology is used as a tool to enhance the teaching-learning process. Any use of technology will also be beneficial to how learners learn and will improve their results. Technology is one component of the repertoire of learner learning. Factors such as learning tasks, learner characteristics, learner motivation and the role of the instructor are key elements in successful learning (Wulf, 1995:46).

Factors that hamper the growth of communication and the use of elearning are the lack of national policies, the lack of communication structures within countries and the lack of infrastructure (Saint, 2001: [online]). Butcher, Day and Legoabe (2000:63) support the view that elearning cannot take place in Africa if the infrastructure is not in place. However, progress has been made where infrastructure and national policies exist. Close co-operation and collaboration exist between different countries through Distance Education of Southern Africa (established in 1972), which incorporates all institutions in the Southern African region that are involved in distance education and electronic education (Setsabi, 1999:1).

Darnton (1999:5) is of the opinion that elearning can be as effective as classroom-based education. The problem is, however, that different technologies need to be employed and incorporated into distance education. Other problems are the embedded skills required of learners (e.g. computer literacy) and the technical support necessary to assist learners and lecturers to become fully interactive with their courses and their communication. Massy (1997) adds that the human factor cannot be replaced by technology alone, especially in higher education. Therefore the role of professionals must change to accommodate technologies. Educators must be multi-skilled and become content experts, design experts and process managers. Added motivational and mentorship support is needed to facilitate the learning process.

Massy (1997) is of the opinion th cts learner learning and satisfaction. Technology acts as communicator between learning components but is not irreplaceable. Factors like learning tasks, learner characteristics, learner motivation and the role of educators are essential for effective learning. Technology can be beneficial if it improves learning and teaching.

Law, as cited by Webster (2002:10), states that distance learning is ideally suited to people who are working. Psychological preparation is needed together with self-discipline, hard work, drive, self-motivation and goal orientation. A high level of maturity and sense of accomplishment is required.

According to Viviers (2001:6) encouraging reflection, providing control, directing attention and adding a new dimension can enhance Web-based learning. Web-based training courses can encourage learners to reflect and bring their own ideas, experiences and assumptions into the learning process. Learning experiences can be adapted in particular to the path, rate and depth of the content studied. Learners can develop new perspectives by using tools such as email, chat rooms and discussion talks to interact and share knowledge. As such, self-study and discovery are involved.

According to Zoller (2002: [online]) the following are necessary for the delivery of effective learning:

- Institutions must be encouraged to include presentation, guided learner practice and assessment.
- A problem-solving approach should be followed to adhere to clear and relevant objectives.
- Course material should be supported by software that lends itself to interaction between educator and learners, providing tools for immediate feedback.
- Courses should be designed from simple to complex and must guide the learners with sufficient opportunities for practice.
- Courses should use all forms of multimedia like text, graphics, video and animation to enhance learning processes.

An important aspect to consider, according to Knight (2002: [online]), is that traditional course material cannot simply be replicated on the desktop. The enormous volumes of text are not suitable for the adult or working learner to master, as their timeframe availability does not support this type of learning. Instead workers need easy and immediate access to solve their immediate problems or to complete the activity at hand.

Knight (2002: [online]) explains tl rom formal or traditional mindsets is needed. The key element of learning, whether in higher education or business, is not what or how much the worker/learner has learnt, but rather how the learning can be applied to improve the worker/learner's performance.

4.2.5 Elearning and higher education

This section serves to show how elearning functions in a higher educational environment.

Distance education technologies are expanding at a rapid rate. The latest technologies often neglect to address the characteristics of learners and their individual needs. New roles have to be adopted by the educator, site facilitator and learner. The Office of Technology Assessment has found that there is no one best use of technology and no one best way of teaching with technology. The answer lies in the flexibility of teaching approaches to suit learners by using the different options offered by technology (Sherry, 1996:1).

An approach where learners are actively involved forms the basis of knowledge to be learned. Such an approach incorporates constructivist principles and problem-based learning. To be successful in this approach in elearning, a move away from the traditional systems to a model that is more complex, interactive and evolving must take place. Knowledge has to be presented and designed in instructions that are interactive and assist learners to construct new knowledge. The basis of such a model is to offer the learner an experience as close as possible to the traditional educational system. To achieve this, the elearning system offers vast technologies to make this quite possible (Sherry, 1996:3).

Technology plays an important role in delivering education, but any successful programme must focus on the institutional needs of the learners. The age, socio-economic background, culture, interests and experiences of learners, as well as their educational level, need to be assessed to determine the educational methods and the form the delivery of education will take. The role of the educators in the delivery and instruction of learners is vital in achieving success (Sherry, 1996:5).

Charp (1994) in Sherry (1996:10) notes that, "greater autonomy, learner characteristics such as active listening, and the ability to work independently in the absence of a live instructor become crucial for success."

At Technikon Free State the majority of learners that participate in distance learning courses are adults. Elearning is relevant to educational issues related to adults as learners and uses andragogical principles, as well as constructive theories, to support elearning. Kearsley and Shneiderman (1999) in Kearsley (2000: [online]) use the engagement theory in their approach to elearning. The fundamental principle of this theory is that learning activities should be interactive and worthwhile. Cognitive processes should be assisted by various applications of technology enhancing difficult learning areas that would be difficult to master otherwise (Kearsley, 2000: [online]). This is also a key assumption of adult learning.

4.2.6 The quality and accessibility of elearning in South Africa

Pillay and Macfarlane (2002:2) suggest that the quality of education in South Africa has to be improved and in doing so learning should be made more accessible to learners. Elearning can serve to meet this need in both individual and computer training. Elearning offers the benefit that learners can study interactively through outcomes-based learning models while living less expensively than they would on campus. The new outcomes-based curriculum is ideally suited to the elearning environment. Limited resources are optimally utilised through quality learning materials and courses delivered through technology supported by academics in both the corporate and educational sectors.

As nearly 75% of the population in South Africa is illiterate or semiliterate, elearning can offer a solution to the problem. The greatest benefit of elearning is that distance has no effect on course delivery. The development of adults is vital for the growth and development of a country like South Africa. Where exclusion of education has taken place in the past, elearning can now be brought to learners. The biggest problem is that learners do not have access to or are unable to attend full-time courses. Elearning offers a solution to eliminate problems in accessibility (Cape Times, 1998:15).

Freeman (2002:50) states that adults are desperately in need of training. The "corporate university" idea focuses on developing adults and their skills in an industry or company-focused environment. Learners need to become more business oriented and must be able to apply their knowledge in a practical manner. Many university learning materials are outdated or do not have a practical component as part of the degree. The corporate university concept is aimed at targeting a specific company to

address special needs and to with the latest developments and technology.

The South African providers of education have to step up the process of delivering education or else they will lose not only valuable opportunities, but also clients (learners) who desperately need their expertise. Overseas companies are already focusing on the South African market. South Africa needs much more throughput to stay globally competitive. The corporate university idea does not automatically reflect a degree, diploma or full qualification, but rather enhances the development of individuals and their skills to address shortcomings in the workplace (Freeman, 2002:50).

In addition, providers of education can assist learners to overcome entrance requirements of universities. Distance learning and especially elearning has the potential to improve the accessibility of learning in a cost-effective manner. It also provides opportunities for flexible learning, lifelong learning, removal of barriers to education and recognition of prior learning, and is interactive and learner supportive. It falls within the National Qualifications Framework and SAQA principles, has quality learning equivalents of full-time courses, and incorporates both public and private sectors of education (Sowetan, 1998:24).

Of crucial importance in South Africa is that universities must adapt their courses to suit business, or otherwise business will start to do their own training. This was previously not possible, but with the new dispensation anybody can register as an educational provider with SAQA and have their courses accredited. Education can become a corporate affair. Company investment in education is becoming a critical vehicle to attract and retain employees. Companies need to stay competitive and are therefore already pursuing this avenue. It has also become easier, since their respective Sectional and Educational Training Areas (SETAs) assist them in sending their staff for training. Tax benefits are also being passed to companies to train staff. Adult learners who are current and future elearners will expect higher education institutions to deliver the same quality and efficiency as corporate universities or overseas providers of education, which will lead to a customer-driven concept (SAQA, 2000: [online]).

Next, the researcher shall explain why elearning is valuable in education by focusing on the benefits for learners, educators, academic institutions and the country.

4.3 THE BENEFITS OF ELEARNING

The greatest benefit of elearning is that it has the capacity to retrain and reskill South Africa's workforce by providing training and learning outside the normal hours of work. Results, accreditation and certification can also be done electronically worldwide. Most elearning courses can be re-accessed for retraining. Traditional methods of education do not cater for this commodity. Another benefit is that elearning is fast and flexible. Time, place, space and pace constraints can be managed and adapted to the learner. It is an ideal tool to enhance and improve the quality of education (Mayor, 2000: [online]).

4.3.1 Benefits for the learner

Porter (1997:12) attributes certain qualities to distance learning as an effective method of education and training, and beneficial to the learner. Some of these qualities include information sharing and experiences in the design and provision of materials. Provision is made for additional educational opportunities for citizens of all ages, backgrounds and abilities, with similar and varied interests, at any time, place and pace of learning. Benefits of distance learning include:

- Learn at own pace
- Learn at own place and time
- Learn about new courses and alternative courses and courses not offered locally
- Engage and learn from well-established providers that have international accreditation
- Study and engage in courses according to one's own needs and preferred method of study
- Practise and keep in touch with technological advances by employing and experiencing different technologies
- Direct one's learning at what one enjoys, desires or seeks in the effort to be functional in the home or workplace.

Elearning will not replace instructor-led education entirely. Role-playing, coaching, one-on-one feedback and sharing in the best practices are areas that elearning technologies are still exploring. Personal contact in team building cannot be replaced by the elearning curve. Another concern is that the content or delivery is only as good

as its design. Instructor-led tra[illegible] as good as the instructor-learner combination and the preparation. Elearning is consistent, controlled and suited to individual learners' styles. Learners can interact according to their own schedule, taking their temperament into consideration. Institutions can interact with learners personally via the various technologies. Instant feedback and monitoring, as well as assessment, can be conveyed at whatever level or detail that the institution chooses (Mayor, 2002: [online]).

Other benefits of elearning courses are that learners can progress at their own pace and tackle single courses within a short space of time instead of multiple subjects per semester. The nature of courses offered is also more suited to the needs and wants of adult learners. This reflects highly in the par roles of learners (Blass, 2002:5).

Elearning can be adapted to suit different types of learners and has the potential to reach the physically disabled and mentally impaired. Professionals like doctors, lawyers and psychologists can obtain the latest technological advice to improve healthcare and can share their knowledge, skills and experience worldwide. Conferences can be attended through video-conferencing without leaving the workplace. Consequently learners are actively involved in their education and are not mere passive consumers of education. Learners, by means of universal "best in class" content and regardless of their location, have access to greater flexibility and learner centredness through active participation. Elearning courses also provide support for learners and enable them to communicate with other learners via email. Mutual collaboration amongst learners plays a vital role (Thompson, 2000: [online]).

Learners today are faced with multiple modes of learning and should choose the method that best suits their needs and pockets. The individual's needs have to be met to fit the business environment. Courses have to be designed to meet learners' needs in a global environment, taking both culture and context into account. Information technologies have to be used to assist adults and learners alike (Pillay & Macfarlane, 2002:2).

According to Ruinaard (in Business Day, 2001:1) learning occurs 50% faster online than in the traditional classroom setting. The learner can control the pace, time and location, and any sections not understood can be redone and mastered. Awerbach (Business Day, 2001:11) adds that a blended learning approach is a fundamental aspect, as more instructor-led learning is needed for difficult content; however, at lower levels, instructor-led tuition is merely the facilitation of electronic education to the

broader mass of people. Consequent of online delivery is the feedback mechanisms between lecturer and learner.

Solomon (2001:8) states that elearning is a tool to ensure that learners remain productive and employable. For this to happen constant upgrading of knowledge is required. Elearning can deliver knowledge in real time, providing the most recent information.

Other benefits of elearning include decreased absenteeism due to the fact that training takes place on site, which also brings about a reduction in costs. Personal needs and study styles of learners can be accommodated through programme development. Companies can also train their workers to fit the company's style and motto. Learners are also offered a holistic educational experience through the use of multimedia elements.

4.3.2 Benefits for the educator

Elearning can play an active part in education. It is an additional form of education or a contributor that adds value to educational methods between contact and distance methods of delivery.

Technology is used in electronic education to facilitate the learning process. Educators must adapt to improve their skills in becoming facilitators of learning instead of mere transporters of knowledge. Educators must realise that their roles have changed and that technology can help them to assist learners in learning. More interactions between learner and educator have to take place. In our modern society learners have to be multi-skilled, and elearning is an effective way to gain knowledge and skills. Collaboration between learners, as well as between learners and educators and other stakeholders, can provide what is needed for learners to be globally competitive (Business Day, 2001:7).

Educational institutions are also slow to engage in elearning as tool of instruction. Most educators are not even computer literate and many institutions do not have the necessary hardware and software to facilitate elearning. The concern is that institutions of education are tied up with their own on-campus learners and their research faculty (Mayor, 2000: [online]).

According to Finansies en Tegnie its include:

- A wider study field providing more resources. Group participation in education gives learners a global perspective. Collaboration between learners is fostered.
- Costs can be saved as elearning can accommodate learners at various cost structures. Their learning styles and educational preferences can be accommodated.
- Learner progress can be monitored. Lecturers have access to a large resource and course material databases to enrich learning.
- Elearning's greatest benefit is time and cost savings. By making use of technology many barriers can be overcome.

In hindsight, elearning lecturers report that they can no longer function without elearning. In-house or staff development courses have escalated dramatically. Internationally companies following the latest trends and innovations can now do training and upgrading anywhere. Many institutions in the banking sector, for instance Deutsche Bank, are thinking of training all their employees internally or in-house. Financially it is more viable and the company's guarded secrets and marketing strategies can be successfully implemented without external trainers who do not have the correct approach or knowledge to train (Mayor, 2000: [online]).

The greatest benefit of running elearning in-house is that courses can be custom made by an internal course developer. Courses can also be changed instantly, which is not possible if the training is outsourced. Many companies also pay a heavy price when outsourced companies close down or move their business elsewhere. The process is then very costly, as it basically has to start all over again (Mayor, 2000: [online]).

As technology improves, companies can find elearning bouncing back. The biggest drawback is bandwidth and desktop limitations within compounds, but once this burden is overcome things can change. Streaming audio, video, high levels of interactivity, animation and synchronous learning (real-time interaction over the Web) can be used to broadcast classroom sessions to learners in remote locations. The demand from learners to receive these elearning benefits makes many institutions more careful, as it is very costly to implement and maintain (Mayor, 2000: [online]).

According to Thompson (2000: [c ffers many advantages and enables asynchronous delivery of content and service. The "anytime, anywhere" concept makes it an ideal method of learning for people in the working environment, for it is truly flexible. Materials and course content can easily be updated internationally and are not tied to individual instructors. Different modes of delivery can also be implemented to add new dimensions to the delivery of learning content. Physical constraints like parking access, buildings, and space constraints that make it difficult to accommodate large classes, are eliminated. The only negative factor that exists is the initial infrastructure and programme development cost. Different class sizes can easily be accommodated with little cost. Elearning is therefore a very cost-effective method for small and medium-sized training institutions (Thomspon, 2000: [online]).

Synchronous training is real-time training in a virtual classroom. Online slideshows and live interactions via Web video allow learners to engage and interact with the instructor/educator. Private conversation is also possible. Asynchronous training is therefore favoured over synchronous training (Dragan & Behr, 2001:172).

In a study by Gartner (in Dragan & Behr, 2001:172) it was found that live (traditional) and virtual classrooms are both acceptable to learners. Learners still, however, need and prefer face-to-face time with live instructors. Video may assist in overcoming this burden. The biggest problem today remains the huge bandwidth needed for learners to be able to see their lecturer in full view. Many companies cannot afford the outlay on ISDN lines, since bandwidth is often not available and telephone lines are not being upgraded to meet the demand (Dragan & Behr, 2001:172).

4.3.3 Benefits for the higher education institution

Learning institutions can benefit by changing from a traditional to an elearning initiative. Financially and from an academic ranking perspective, many education institutions are moving towards elearning. Knowledgeable educators and staff are the greatest assets within companies. Many smaller companies cannot afford employees to leave work to attend costly seminars or formalised classes. The elearning initiative assists companies to acquire knowledgeable skills without incurring huge expenses. By using synchronous (real-time virtual classrooms) and asynchronous (online at own pace) learning an institution can now engage and improve the skills levels of all their employees. Learners that work asynchronously are able to learn at their own pace and place to fit their own schedules and speed (Dragan & Behr, 2001:172).

Training materials can be alter d kept up to date with the latest technological knowledge. Training can be done worldwide and companies can upgrade instantaneously to all their stakeholders via email. Costs can be saved, as centralisation in the production of materials is possible and new innovations can be distributed worldwide (Mayor, 2000: [online]).

A major concern is that many institutions are not implementing elearning effectively. Chief executive officers (CEOs) and managers do not want to invest too heavily in Information Technology (IT), but prefer to outsource this function. Another concern is that educational institutions or companies do not have the resources or time to get elearning up and running within the company. Specialist elearning companies can provide this function. Educators and company staff are reluctant to pursue elearning initiatives within their industry, as it will require more work (Mayor, 2000: [online]).

According to the American Association of Higher Education (AAHE), research into undergraduate experiences is essential to understand the teaching/learning process. Principles to enhance the teaching/learning process, using communication and information technologies, include methods that:

- Encourage contact between learners and faculty
- Develop reciprocity and co-operation among learners
- Use active learning techniques
- Give prompt feedback
- Emphasise time on tasks spent
- Communicate high expectations
- Respect diverse talents and ways of learning (Chickering & Ehrman, 1996:2).

In elearning there can still be a certain amount of face-to-face contact by means of video-conferencing or Web cameras, but this is minimised. The use of different media has enabled elearning to become a very cost-effective method of educational provision, especially where large numbers of learners are involved. This is an ideal means of providing education to adults and improves the chances of educational success for learners in the South African milieu. Elearning also attempts to incorporate openness in education, thus making it closer to reality. The aim is to ensure that adult learners

receive the maximum support in o achieve success (SAIDE, 1994a:1 and RSA DoE, 1997:10).

4.3.4 Benefits for national education

Elearning offers workers within companies the opportunity to receive updated information or attend courses without having to leave their workplaces. Companies save money in travelling, accommodation and production costs, especially if their products are distributed worldwide or countrywide. Course content is improved daily so as to remain in touch with the latest technology or market trends (Thompson, 2000: [online]).

Training can also be more cost effective, since costs can be lowered by up to 88%. Elearning is used as a cheaper but more effective training mode. Elearning stands central to reskilling and retraining of people (Business Day, 2002:11). The key element in training learners is the interaction between educators and learners, as well as learner centredness. According to Ruinaard (2002:1) learning occurs 50% faster online as opposed to classroom teaching. An argument to support this is that learners are able to control the pace, time and location of learning (Business Day, 2002:1).

Freeman (2002:50) suggests that companies must be more relevant and dynamic. Educationalists should rather focus on the needs of learners and businesses. A curriculum and programme should be developed to meet the demands of the workplace and to stay in touch with national and global demands. The educational provider should develop the learners' skills to suit the workplace. Learners should not be evaluated on the basis of examinations only, but also on their ability to come up with elegant solutions to real workplace problems. Training in South Africa should also be linked to the South African Qualifications Authority (SAQA) and international best practice benchmarks. This is where elearning can be used to eliminate the backlogs of the past. The cost effectiveness is frequently underestimated, as many see elearning as just another form of education.

Electronic education can be used in the improvement of the skills of workers. With elearning course, material can be transmitted electronically. A reduction in time, costs, and development and delivery delay is the result. According to Mecoamere (2001:3)

elearning is less expensive as it ıaced, private and offers continuous assessment and easy access to reference material."

Communities, as elearners, can also benefit through elearning. Disadvantaged individuals and communities are now being trained through elearning. Internet access makes learning available at reduced prices. The Internet provides access to libraries and their databases to provide first-class knowledge at greatly reduced costs (Mecoamere, 2001:3).

One of the greatest benefits of elearning is that new staff members can be trained in their own spare time with little or no loss of production. Learners are given a sense of self-control and control over study material and the improvement of their skills. Less time is also spent on developing study material for etraining. New ideas can be transferred immediately to all staff. Staff can now be more effective and produce better results with firsthand knowledge only a screen away (Fontyn, 2001:7).

In summary, the researcher believes that the greatest benefit of elearning lies in the possibility of increased communication between facilitator and learner, and between learner and learner. Furthermore, it has provided previously disadvantaged people with opportunities to study anywhere, anytime and at their own pace. Through the Internet elearning has empowered people by giving them accessibility to information and by providing improved research opportunities to countries in need thereof. Elearning has also afforded students the opportunity to communicate electronically and to send and receive information. Another important feature of elearning is that information can be accessed and distributed, thus bringing education to learners. An important factor to consider is that travelling can be greatly reduced and the cost of receiving education minimised.

In the researcher's opinion elearning has paved the way for any learner to receive education by removing barriers previously experienced by learners. The next section explains how elearning can be implemented successfully by looking at how it functions in an educational environment.

4.4 IMPLEMENTING ELEARNING

4.4.1 Successful implementation of elearning

Self-teaching through elearning i Nevertheless problems can occur as learners can get distracted and fail to return to the task at hand or simply grow tired and neglect to do their work. Motivation is an essential component in engaging learners in elearning activities and achieving goals set by instructors (Moshinski, 2001:6).

Since motivation is an essential component one should do a careful analysis before presenting any elearning initiatives in order to understand learners and their goals. One should know their type of work and work environment, match values and motives, and use push and pull strategies by requiring and monitoring course completion. Rewards should be included and portals should be created to suit individual needs and wants (Moshinski, 2001:6).

Elearning requires a different educational approach from that of traditional education. Several types of media can be used, including modern electronic technology such as radio, video and computer-aided instruction. Printed material, however, still forms the most important part of the teaching material and is essential to the learning process.

During the course and presentation the following actions must be taken:

- Provide an environment that is conducive to learning.
- "Check" the information.
- Build on the familiar and move towards unknown areas.
- Vary the stimulus by using different media in the presentation.
- Give legitimate feedback by focusing on minor performances that will lead to great achievements.
- Add a human touch and express genuine concern towards learners and their needs. Be sensitive.
- Provide a social context by taking cultural aspects and demographics into consideration.
- Incorporate fun into learning content by using challenges and competition.
- Give learners access to content only when a need arises (Moshinski, 2001:6).

To ensure success one needs to be in touch with learners' feelings and their perceptions. Any minor issue should be resolved in a professional manner so as to ensure that learners do what they are supposed to do, namely engage in learning and be motivated to achieve success (Moshinksi, 2001:6).

To deliver effective elearning a ieeds to be presented to learners. Technologies supporting courses should be available for maximum utilisation in order to assist learners fully. Learning opportunities must be created to ensure that learners engage fully in the learning process. Principles of learning include learning as a primary and critical activity of human assistance. Learning is about a social, collaborative and generative process that involves support and challenge. Learning should change thinking and action within individuals and should be a liberating, inspirational and transformational endeavour (US Department of Education, 2000:14).

Several key factors are essential to ensure that any elearning can take place successfully. Clear policies in line with international and national educational entities should exist. Such policies must be in place to ensure global competitiveness and quality. Support from national government through the proper political structures needs to be in place. The public service should recognise employee qualifications obtained through distance learning courses. Other areas include the availability of professionally trained staff within a national framework to manage such programmes, the complementary use of different kinds of media to enhance the quality and administrative capabilities of courses, and the follow-up of such courses to reinforce teaching. Once such a system is in place elearning can then be delivered as an accredited, acceptable and fully functional section of teaching (Saint, 2001: [online]).

Traditional learning material is rarely ready to go online, since it was designed to accommodate face-to-face learning and not elearning. Problems in content revolve around the fact that it might be old and outdated, it is not outcomes based and contains more facts without defined learning objectives, and the digital format of material is only partially available. Copyright of materials is disputed, as a different set of rules applies to the use of information electronically. New applications to accurately reference and correctly copyright materials must be negotiated with the authors. Editing and user friendliness are aspects to consider when placing text on the Web. Reconceptualisation of material for the elearning environment must take place. Links to resources should be added to course content. Furthermore, exercises and interactions are elements needed to interactively connect learner and material. A learner-centred approach should be followed instead of the traditional teacher-centred approach (Schulze, 2000:14).

In order to successfully implement elearning one should ensure that each piece of course material, as well as an objective or goal, accompanies study material. This is also a fundamental principle in OBE and andragogy. Learners require successful elearning objectives. The job role, needs and outcomes of any training must be

nestled in the relationship betw he learning objective. Learning is inspired if it can enhance or improve the efficiency of one's work (Element, 2002: [online]).

Element K (2002: [online]) proposes that course designers of elearning courses should map the specific learning objectives (outcomes) required for the particular job. The course material, its presentation and the information have to be integrated into the working environment. Simply put, study material can improve one's performance in the workplace. These are referred to as "performance indicators". Another term used for performance indicators is "benchmarks".

The course paradigm in elearning differs vastly from that of classroom teaching. Corrigan (2000: [online]) proposes that it is not that elearning is failing, but rather that the existing course paradigm is not suited to elearning.

The following are characteristics of elearning courses that fail to address the true needs of the learner:

- Group settings do not address the different needs and levels of expertise amongst learners.
- Specific information is not given to learners to assist them in completing their tasks.

Material presented in courses should not only address the present relevance, but must also be relevant to future implementation and use. Learning objectives should not be designed just to test learners, but also to address the need and the usage they will enjoy in future progress and reference.

Corrigan (2000: [online]) proposes the following to ensure that elearning can be successfully implemented:

- Supply the learner with small meaningful chunks of information. Give small objectives to be achieved by using modules that contain meaningful content. Learners should be provided with knowledge that is most efficient and gives immediate performance improvement.
- Study material should be supplied with topics, guidelines and information so that learners can be led directly to the achievement of outcomes (objectives). All course modules should be so complete that the learner can find and do

everything within the m ninology and concepts should be explained and references supplied.

- Course or module objectives should be focused on job-related needs. Training should be relevant and enriched with references to good reference material.
- Courses should be designed to equip the learner to enhance his performance. Short-term goals can easily be measured and therefore the module idea is very practical.

Corrigan (2000: [online]) states that in order to improve training courses, the following guidelines should be followed:

- Explore results-oriented training rather than strict industrial design processes.
- Integrate learning into everyday tasks.
- Understand and develop learning to meet the needs of the learner.
- Group learning should consist of small, targeted bits that should be supported by strong search engines, easily navigated interfaces and feedback surveys.
- Trainers should be paid to achieve business goals rather than be paid per hour of training delivered, which is a common principle in improving performance and production.
- Tests should be a simulation of real-life experiences and be linked to the business environment.
- A course should be designed in such a way that learners can move at their own pace and not that of the group.

4.4.2 Problems with implementing elearning

One area of concern is that there is a lack of incentives for the development of information technology content, coupled with insufficient manpower to develop elearning at institutions. A mindset change needs to take place to allow one to develop one's own materials to suit one's own needs. Copying or outsourcing is not always a good strategy. What is good for South Africans will most probably not be good for the Chinese, for instance, since values, attitudes, knowledge and needs vary tremendously amongst countries.

The use of information and com ologies in learning summarises the concept of elearning. Information and communication technologies differ and are unique to each organisation and the individuals within such an organisation. For example, Technikon Free State's elearning should be different from that of Wits University, taking into account the level, institution, cultural diversity, access to computers, personal finances, affordability and accessibility, to name but a few.

Another serious concern is that the South African system of qualification accreditation has become outdated. The new developments on the part of the government (Transformation of Higher Education, Curriculum 2005, SAQA Act, NQF) will all assist in overcoming this handicap. This is a long-term process, however.

According to Finansies en Tegniek (2001:64) limitations to the introduction of elearning include the following:

- Cultural differences have an impact on the preparation of learning material and the appointment of lecturers.
- Elearning does not provide an immediate source of income for companies, as it is expensive to invest in new technologies. Private and public companies do not always plan accordingly and many subsequently close down.

Elearning supports constructivist theories of learning whilst most South African education is still wrapped up in behaviourist principles of education. The solution is to use elearning as a tool whilst keeping the requirements of learners, educators and management in sight.

4.4.3 The role and function of the educator in elearning

The aim and motivation of any educator is to educate. The success of any programme offered in education and by educators does not lie in obtaining a qualification, but in the ability of a learner to use his education to change the world through the use of skills, knowledge, attitude and values. Hence, to educate is to equip each learner with the best possible means to serve in a highly competitive world. Gone are the days when everything was good for everyone. By using technology a future for education can be created (US Department of Education, 2000: [online]).

Sufficient access and support will ensure that learners and educators are better equipped to face change and provide solutions for an ever-changing environment.

Technology can provide the bac learning and improve achievement for all learners. A radical change did indeed take place with the introduction of Curriculum 2005, as well as with the passing of the law governing Higher Education and Training, the implementation of the South African Qualifications Authority Act and the implementation of the National Qualifications Framework (Olivier, 1998:4).

The United States introduced a National Educational Technology Goal Plan in 1996 to enhance and improve teaching and learning. According to the US Department of Education (2000: [online]) these goals are as follows:

Goal 1: All learners and teachers will have access to information technology in their classrooms, schools, communities and homes.

Goal 2: All teachers will use technology effectively to help learners achieve high academic standards.

Goal 3: All learners will have technology and information literacy skills.

Goal 4: Research and education will improve the next generation of technology applications for teaching and learning.

Goal 5: Digital content and networked applications will transform teaching and learning.

Electronic learning offers enormous benefits, but it does not do everything and surely does not provide and cater for all aspects of learning. When subject content is high or of a personal nature, live teachers can still play a vital role. With more technologies being introduced Information Technology departments within organisations will have to provide a stronger support base to facilitate training and will have to upgrade their systems to meet the demands of institutions and educators (Mayor, 2000: [online]).

4.5 SUCCESSFUL ESTABLISHMENT OF ELEARNING PROGRAMMES

Elearning is an efficient and cost-effective means of providing private, individualised instruction at the learner's convenience with enormous benefits. It allows adults to attend classes without being restricted by actual attendance or having to be transported to the physical class. As noted by Lippert (1993:96) certain conclusions

lead to the provision of elearnir tial to its successful establishment. These include but are not limited to the following:

- Elearning centres should cater for a broad spectrum of life skills and cultural views.

- Elearning courseware should not be modified unless no alternatives exist. Careful planning and development is needed before establishment.

- Objective evaluation methods and assessment are critical to ensure the success of any innovative project.

- Staffing is critical as learners will be directly influenced by the skills, knowledge and motivation lecturers may possess.

- Elearning can serve the entire community since it can be accessed throughout the entire day. Although costly to launch, the capital outlay is ministered by maximum use (Tiffen & Rajasingham, 1995:168)(compare Lippert, 1993:1)(Badenhorst, 2003: [interview]).

In the analysis of elearning one needs to take as many angles as possible into consideration to ensure that the learner's (client's) needs are met fully. The current educational system, laws, regulations and requirements, and especially the joining of hands with business, should be considered as elements in the design of a system (framework) to develop and implement elearning. The diversity of the population and the learners' needs and future expectations are elements that are crucial in the design and development of a framework to implement elearning. The main focus is, however, the learner as client and his needs.

Tiffin and Rajasingham (1995:19) see education as the practice of a kind of communication. Information technology can be used to improve communication between learner and teacher in an effort to improve education and educational goals. Education is seen as an umbrella term that incorporates all learning whether it takes place directly or indirectly by means of technology. Most education takes place in the classroom, but the challenge is to take the classroom/educator to the learner (without losing quality). The potential of information technology needs to be fully optimised if elearning is to be more effective than classroom education. Education is seen as the supply of an effective educational communication system by using the most effective technology available.

Elearning courses must be designed by using the correct software to enable learners to interact with their respective lecturers.

4.6 GOOD PRACTICE IN WEB USAGE FOR STUDENTS AT TECHNIKON FREE STATE

To implement successful elearning certain principles in utilising technology have to be in place. Chickering and Ehrman (2000) propose the following principles of good practice, to enable the power of new information and communication technologies to be realised. These include but are not limited to the following:

- Good practice encourages contact between learners and lecturers. Communication technologies may improve learner access to learning material and learning environment.

- Good practice develops reciprocity and co-operation among learners. Learning is enhanced if collaboration can be improved and social bonds between learners strengthened.

- Good practice uses active learning techniques, as a range of technologies to encourage active learning supports learning.

- Good practice gives prompt feedback. This will ensure active participation from learners if they receive feedback on their respective assignments. New technologies can make provision for feedback in many ways by supplying ongoing critique and keeping a record of growing capacity.

- Good practice emphasises time on "task". Learners must be made aware that time is critical in completing course projects on time. New technologies assist learners to interact with lecturers in a much shorter time by granting access to learning resources. New technologies improve learner participation and interaction.

- Good practice respects diverse talents and ways of learning, as new technologies assist learners to learn in the way most effective for them.

4.7 QUALITY IN ELEARNIN(IVERED

It is clear that equity, access and development in education need to take place in order to meet acceptable "quality standards". The NCHE Report makes it clear that a "comprehensive, development-oriented quality assurance system stands central to the establishment of a single co-ordinated higher education system" whereby the difference in quality across institutional programmes can also be tackled and eradicated (Strydom & Van der Westhuizen, 2001:11).

According to SAQA as cited in Strydom and Van der Westhuizen (2001:86)(compare NEA, 2000: [online]) the elements or benchmarks in quality assurance and management planning include the following:

- The design of programmes must be targeted at learners and directed at improving their attainment of the necessary standards.

- Direct improvement of quality of institutions by improving teaching and learning strategies is important. Equal emphasis should be placed on the outcome (output) as well as the process of attainment in the educational processes.

- Learning must be flexible and adaptable to changing demands and circumstances.

- Inclusive, participatory ownership through democratic processes on the part of all stakeholders ensures quality management.

- Learners are the core business of quality management and regular feedback is needed to retain standards.

- Progress and not merely outcomes or procedures must be measured against a system of measurement where the learners stand central to all learning.

- All aspects embedded in the framework of quality assurance must be discussed and understood by all as the way forward.

- The diversity and delivery of teaching methods must be measured through standards that fall within the quality standards framework.

- All stakeholders must mu in a transparent way by using and following internal capacity to improve assessment and quality assurance.

- Self-assessment, peer review and external meta-evaluation should be possible within such a system.

- Quality should be sought regularly and on an ongoing basis to bring about enhancement and improvement.

- Formal and carefully documented analysis should be done to ensure accountability through horizontal and vertical audits and participation.

It is therefore of utmost importance that all the above-mentioned criteria form part of the framework for elearning at TFS, so as to ensure quality that is in line with the New Plan for Higher Education and SAQA's policy of ensuring quality within the higher education scenario.

The predominant trend worldwide is to ensure quality of programmes offered. By ensuring proper delivery systems, access, governance and quality through the various technologies, the overall quality of learning programmes and best practices can be achieved. Competency-based criteria are used to accommodate prior experience together with performance-based and assessment training. It is of the utmost importance to ensure that the workforce in a country is re-skilled and trained to meet expert demands and be globally competitive (Thompson, 2000: [online])(compare Badenhorst, 2003: [interview]).

The quality of elearning programmes in respect of content, course structure, agreement, articulation, responsiveness of traditional institutions and issues of privacy is an enforcer in promoting quality in elearning environments (Thompson, 2000: [online]).

4.8 CHARACTERISTICS OF ELEARNING

An important aspect is the ability to understand the culture of learners, especially in a country as diverse as South Africa. The distance education programmes of TFS have always and will continue to strive to:

- Acknowledge the success of the group and the individual in elearning.

- Work as creatively as possible to use all individual abilities to support successful learning, as well as colleagues, both on and off campus.

- Be flexible in decision making, be effective and be innovative in an effort to improve and deliver programmes of quality.

- Be reflective in learning from experience and be open to change while keeping the learners' interests at heart.

- Expose ideas and work practices to colleagues and outsiders to improve skills and to become globally competitive (Van Rensburg & De Beer, 2000:34).

The next section focuses on the technologies available to apply elearning.

4.9 TECHNOLOGIES IN ELEARNING

Elearning needs particular technologies and tools to facilitate learning. In this section the researcher will discuss the Internet and World Wide Web (WWW) to show how these technologies are used in the educational process and especially in elearning.

4.9.1 The Internet

4.9.1.1 The role and function of the Internet

Information forms the basis of our modern world. The use, distribution, control and management of information have become important and enormous ventures. Knowledge will continue to be made available through many systems, which will vastly change information and communication. The Internet will therefore not only introduce people to new ideas, but will also globalise the information gaps between countries and continents. All will soon feel the global effect, as one's office is no longer stationary (Ryan, Scott, Freeman & Patel, 2000:7).

According to Porter (1997:38) the Internet is an international network that links one computer to another. Serim and Koch (1996:32) describe the Internet as nothing more than a whole lot of computers communicating with each other. Each and every computer has the ability to store information. The Internet connects all these computers by means of a link. This link is referred to as a Net. The name "Internet" is

made up of the terms "inter" (co een computers) and "net" (joined by means of a link). The Internet connection of one's computer links one by means of the Net to all other computers that are linked to the same Net, giving one access to the information available. Collis (1996:26) describes the Internet as an inter-network of computer networks that are connected through a variety of gateways. The power of the Internet, as the researcher sees it, lies in the multitude of computers that are connected, providing the user with an immense pool of knowledge.

The Intranet is an internal or in-house network designed for use within a company or institution. Information of any kind can be sent to clients to inform them of meetings and upcoming events. The Intranet can also be used to notify elearning learners of date and event changes and to provide them with any valuable information. Information can also be personalised or sent to groups as such. In-house training courses can also be held via email. A very important aspect is that individuals or groups can be reached without them having to leave their workstations to listen to announcements or messages. This has enormous value in larger companies since it saves time and money. It is very efficient for trainers and learners and very cost effective for companies (Porter, 1997:104).

The Internet is the world's most advanced mode of delivery in education. The Internet controls our lives and in only four years has achieved what audio took 48 years to achieve, namely the reaching of 50 million people. A tenfold increase is expected within the next five years. An annual growth in usage of 64% is expected in the next five years. The real value of the Internet is associated with opportunities in electronic commerce and trade, the integration of television and radio, entertainment systems, and the communication opportunities offered by email, audio and video-conferencing. All these have an enormous impact on education by assisting learners to gain new skills and to adjust to the information age (Ryan *et al.*, 2000:8).

Ryan *et al.* (2000:25) compare the Internet to conversation and view communication as the vital element between teacher and learner and between learner and learner. The Internet supports a variety of ways in which this interaction can take place. Leiserson (2002: [online]) defines synchronous learning as a "real-time, instructor-led online learning event in which all participants are logged on at the same time and communicate directly with each other." In this virtual classroom the instructor maintains control with the ability to call on participants. On most levels, educators and other learners can interact through virtual means like whiteboards, audio and video-conferencing, Internet telephoning or two-way broadcasts.

The Internet is an inter-network of computer networks connected through gateways that use the same convention. These conventions determine how data will be moved between courses, how messages will be stored and how errors will be dealt with. These conventions are called protocols and the sharing of these protocols worldwide to bring about uniformity that makes communication and the Internet possible. Another characteristic is that each network system sharing the Internet system uses a common display of address by using Internet Protocol (IP) addresses (Collis, 1996:26).

Only a certain number of tools on application are available on the Internet. These include remote login (telnet), file transfer (ftp), electronic mail (email with network news, groups of news reports), real-time communication (Internet Relay Chat), and information systems (such as Gopher and the WWW). Of all these tools, the WWW has featured the highest volume and service level since 1995. Personal communication and electronic hyper-linked publications are the major applications used (Collis, 1996:27).

The Internet was originally designed as a network to facilitate communication and collaboration so as to ensure proper and fast communication amongst researchers and educators, as well as governments, agencies and industry. New roles include electronic commerce and the provision of distance education and learning solutions to all (Minoli, 1996:235).

Email was the most used Internet application up until 1995, but it has since been superseded by the WWW. Email is used as a tool for collaborative research processes. It houses a wide range of delivery agents and text editors. Ultimately the delivery agent is UNIX, which includes SMTP (Simple Mail Transfer Protocol(s)). SMTP is used to transfer messages between different hosts. Internet providers, as delivery agents of both protocols, use gateways to communicate directly. Email services are on offer by most Internet access providers (Minoli, 1996:238).

The Internet facilitates the limitations of wide-area networks (WAN's) and incorporates and converses with anyone who is connected. Websites can be accessed and emails sent. In the use of email as Internet application and as an advanced tool that can enhance elearning it acts as primary means of communication among learners/educators/trainers/institutions and their vast array of knowledge. Email acts as a network to reach individuals or groups. Attachments such as text or graphics can

be transmitted by means of seco video-conferences, thereby offering an additional educational advantage (Porter, 1997:104).

The Internet's strength lies in the provision of infrastructures from various industry segments. The following are some of the advantages offered by the Internet:

- **Support by network providers.** Internet accessibility is supported not only by traditional Internet providers, but also through local-exchange carriers (LECs) and inter-exchange carriers (IXCs).

- **Number of people reached.** This is estimated at between 15 million and 20 million and is escalating daily.

- **High-performance backbone.** The National Science Foundation (NSF) backbone is improving its capabilities by moving from a Digital Signal 3 (S3) platform to a higher performance network based on Asynchronous Transfer Mode (ATM) and Synchronous Special Network (SOMET)

- **Expanding range of applications.** The traditional role of supporting data networks, which serves research through collaboration of researchers, learners, commerce and government, is now expanded through the support of entry-level two-way video and audio applications, making communication visual and more effective.

- **Affordability.** The Internet is one of the least costly approaches to the provision of interconnection and eliminates many barriers like travelling, distance and physical research, since it has so many applications and tools available.

- **Extensive information resources.** To distance learners in particular the Internet offers many features such as online libraries, text delivery services, government information, free documents, databases, images and many other files. Search engines also provide learners with easy access to most information.

- **Ease of use.** Services such as the WWW allow easy access to the Internet, as Websites are easy to utilise with no difficult steps to follow.

The Internet is an important component in the supply and utilisation of information, but it cannot replace the National Information Infrastructure (NII) (Minoli, 1996:245).

4.9.1.2 The educational value of the Internet

The Internet can change and reform the way in which teaching and learning take place. Through Internet connectivity, learners and educators discover its value and the opportunities available. This connectivity can bring about change not only in the school structure, but also in the interaction between all stakeholders and within communities (Serim & Koch, 1996:5).

The Internet provides active learning environments in which one can engage in in-depth collaborative projects through self-management and responsibility. The Internet assists learners to become problem solvers through interactive communication and collaboration. Teachers benefit by drawing on the vast resources available online to develop skills and gain knowledge in the effort to empower their learners to be learners, and not merely listeners, through active participation. Schools benefit as they do not have to keep expensive and outdated resource centres, but can have the latest inter-collaborative materials available to assist learners and educators. In remote locations time and money can be saved through electronic education methods. The efforts of schools, learners and educators can be channelled to the community by means of service delivery and a school-community relationship. Schools can offer Internet connectivity and training to assist the local community to address their lack of technology and/or to access technology (Serim & Koch, 1996:6).

4.9.1.3 Limitations of the Internet

The following limitations are discussed to show how they limit concepts like open learning, flexible learning and elearning. These limitations should be considered in the establishment of a framework to benchmark elearning at institutions.

- **Lack of support for rural communities.** The lack of infrastructure (electricity, telephone connections, etc.) continues to prevent the Internet from being accessible to large numbers of users. Rural communities are the key drive behind the need for a ubiquitous National Information Infrastructure.

- **Lack of information filters.** The full range of information on the Internet may not be available, or the highest educational, social or moral values may be lacking.

- **The Internet as public foru** debated, discussed and generated sometimes spread negativism and cynicism, and are not always conducive to a highly educational community.

- **No guaranteed performance.** Distance education providers cannot always guarantee the quality and credibility of their courses and the information they supply. The throughput cannot always be measured at a consistent and reliable level. The mechanism to combat this lies within the reserving of bandwidth, but the Internet lacks this capability as it serves million of organisations and individuals.

- **Lack of antiviral software.** Internet, email or downloaded files have been known to contain viruses, worms and other related forms of corrupted devices. It is impossible for each and every machine in the network to contain all the software to eliminate such viruses. The problem is that new viruses are created daily, making this an almost impossible task.

- **Junk email.** Unmarked and useless email can sometimes flood the Internet and can also hamper the proper functioning of workers and their machines.

- **Security issues.** Lack of security is one of the weaknesses of the Internet and limits its usefulness in inter-organisational communications, especially amongst those organisations functioning as distance education providers (Minoli, 1996:246).

4.10 THE WORLD WIDE WEB (WWW)

The WWW is a system that links information stored on the Internet. The WWW houses billions of Websites that contain information placed there by all the different users. These sites are linked by a multitude of hyperlinks that enable learners, researchers and educators to access this information through a suitable client (e.g. Netscape, Mosaic, Yahoo), also referred to as search engines or stations. It is also possible to navigate through hypermedia documents that can include text, sound, still images and video. The WWW makes information available through suitable clients, because many Internet users are not experienced with UNIX systems or HTML (Hypertext Mark-up Language) (Minoli, 1996:238).

The WWW enables the Internet to be more user-friendly, giving access to groups of information users such as learners, lecturers and parents. The WWW is also easily

accessible since distance and tin The search stations assist users to locate material rapidly on the multitude of Websites available (Minoli, 1996:248).

Services on the WWW include electronic whiteboards, bulletin services, online libraries and catalogues, directory services, archive files and video-conferencing. A brief description of each of these services follows:

- Electronic whiteboards allow notes to be stored with viewers synchronously and also enhance dialogue amongst researchers, educators and learners.
- Bulletin boards allow messages to be sent and accessed by other users using similar bulletin boards. The best known of these is USENET and commercial bulletin boards such as CompuServe.
- The Internet online library service provides users with easily accessible online databases for research. It also offers access to shareware and freeware courses.
- The Gopher service provides information in a simple heroic system using menus and files to locate and find information. It is an excellent research tool.
- Directory services supply users with directory information on other users, services or service providers. It also assists users to easily find the information needed for a particular purpose.
- Archive files act as database, keeping catalogues of the contents of file archives and indexing these for easy accessibility through telnet and email.
- Hypertext gives the user access to related issues or to a keyword in the same text or on other Websites. It links issues to cover the same topic via a link.
- Video-conferencing ensures two-way and audio communication between learners and lecturers. It is an excellent tool as it can be used on an international scale and also reduces the physical distance between and isolation of lecturer and learners. It also provides access to eternal sources of knowledge through video and audio images and removes the distance barriers. It enables the learner to visit places that are not financially or otherwise accessible (Minoli, 1996:249).

The WWW (World Wide Web) makes the Internet more user-friendly and is an ideal tool for education – specifically distance education. A classroom can be built in virtual reality by using a homepage. Information such as the syllabus, exercises, literature, references and the instructor's biography can all be used to link the classroom to the learner. Links can also be brought into the homepage with other users (learners) and

libraries to facilitate the commur etween learner and information and between learner, instructor and other learners (Gottschalk, 2001: [online]).

Sound recording and its multiplication is quite complicated and not as easy to use as graphics. Sound cannot be seen or clicked on and is difficult to control. It has very limited application in resource-based learning or on the Web. The multiplicity of sound also makes it a difficult medium to follow, especially when combined with other visual stimuli. Increasing bandwidth with better and faster software is now assisting users and designers to use sound more effectively and with more accuracy. Audio technology allows for music clips and audio bandwidth to be accessed directly without having to download first (Ryan *et al.*, 2000:58).

The application of sound has opened the way for many radio stations to broadcast via the Web. Another advantage is that sound broadcast can be saved and replaced once it has been received. This feature assists learners to conduct research from live news feeds, and saved sound files can be edited and new assignments created to be used on demand. Sound can interact with video to give justice to music and to enhance that particular subject area. Sound can also be controlled through the use of headphones with stereo abilities. Sound and video can simulate movement in space. Designers can achieve a reality such as touch and texture through this medium (Ryan *et al.*, 2000:59).

MP3 is a compression format that makes it possible to stream sound over the Web and listen to high-quality sound such as a CD. Files can be downloaded and CDs created without losing quality. Educational developers can use small, quality files to transmit audio interviews with experts in all fields of education and technology (Ryan *et al.*, 2000:60).

The main advantage of the WWW is the limitless pool of all types of information available. Any information can be stored electronically and downloaded or immediately used online as long as it is stored and the site is available. The other advantage is that learners can work at their own time, pace and place to facilitate learning. Another advantage is that educators can place assignments, courses and information on examinations and samples on the particular site for a limited time only. Information can also be updated and made available. Video clips and colour, as part of multimedia, can give a site more appeal. Basic information and other hyperlinks can be incorporated into sites to assist learners to maximise their potential. Sites offer reading, listening and interacting capabilities, with added communication abilities

between learners and educators can be used directly to enhance the site and learning in itself. Hyperlinks form an important part of the overall development of learners and broaden their mindset (Porter, 1997:128).

Another feature is that the WWW can be accessed anywhere in the world, as long as computer connectivity is ensured. Multiple perspectives on information available, user control in applying hyperlinks to other sites, as well as self-containment, serve to make the WWW such a valuable tool. The design of the WWW and its environment determine the user visitation and its success (Remmers, 1998: [online]).

The hypertext, networking and multimedia characteristics of the WWW provide the user with multiple choices for entering the particular site(s) he/she needs. This in itself can stimulate the user to apply and integrate the multiple contexts (themes, points of view, analogies, metaphors, etc.) via the multiple hypertext linkages. These allow users to utilise the multitude of multifaceted knowledge available (Remmers, 1998: [online]).

The novice can benefit by using all the opinions and information available as background to the formation of an own opinion. There is a multitude of transparent, surface, in-depth and expert information to suit each and every individual. The numerous sites per topic are still on the increase, as the WWW continues to grow daily. Multiple opinions and ideas from the various sites stimulate thought processes in learners. However, this can also be a dangerous practice, since many sites contain merely opinions and not researched information (Remmers, 1998: [online]).

Different WWW environments support different perspectives by making use of different media like text, graphics, audio, video and simulations. The limited bandwidth available does, however, influence the speed and downloading capabilities of multimedia elements (Khan, 1997 in Remmers, 1998: [online]).

Some aspects of the WWW will subsequently be discussed in order to provide an enhanced understanding of this powerful electronic tool.

4.10.1 User control

Users have the ability to control all aspects of Web pages, as they can select the page and the time they wish to spend on the visit. Information gathered can be personalised, downloaded or reconstructed to suit the individual (Yang, 1996 in Remmers, 1998: [online]). The Web environment can be controlled through the

learner's own usage and learnin ir site. The hypertext feature of the WWW encourages learners to actively seek the information needed, rather than passively absorb all types of material.

User controllability can also be disadvantageous as too much visual material presented in Websites can lead to disorientation. The fact that information can be scrolled through quickly might lead to information being missed. On the Web only one page can be viewed at a time, whereas with the hard copy, pages can be placed alongside each other and be viewed simultaneously. It is therefore essential that instructional designers structure their Websites in a logical and easily navigable manner (Remmers, 1998: [online]).

4.10.2 Self-containment

A WWW environment is fully self-contained and readily available to anyone who wishes to access it. It can contain integrated information, reference material, course material, examinations, records, feedback, tools, discussions and collaborative systems to help the user ensure optimal usage. It contains links with other sites, has help facilities available live, and answers frequently asked questions (FAQ's). It has the ability to store information and the content that has been placed there can be changed.

Users can access the WWW and receive, complete and send assignments, reports and examinations confidentially. The WWW can also be accessed internationally, which makes travelling unnecessary and saves time, money and effort. Verbal and non-verbal communication can be built into Web pages to improve social contact between learner and educator. Time-and-place independence is a major benefit and learners can thus determine their own progress in their own available time (Remmers, 1998: [online]).

4.10.3 Authenticity

All material placed on Web pages brings realism and authenticity into the learning experiences of learners and improves the insight of anyone who accesses it. The WWW enhances all that enters its domain on many educational levels (Kearsley, 1996 in Remmers, 1998: [online]). The WWW brings information to the user's home where learning about different cultures and civilisations can take place. Virtually all aspects known to mankind are available on the WWW. The problem is that not all information presented is educational or moral in nature. Most information is not always properly

researched and scientifically pro[illegible] to misinterpretation, bad manners, hostility and stupidity if information is not properly understood (Remmers, 1998: [online]).

4.10.4 Ease of use

Individuals can easily search for information on the WWW. The numerous search engines make this task easier, since they have databases that connect the user with all sites that contain the desired information. Lycos, Google, Yahoo and Aardvark are just a few such engines (Khan, 1997 in Remmers, 1998: [online]). The structure and design of the WWW environment will influence the ease of use. If WWW environments are poorly designed and structured, or contain too much audio and visual material, it might lead to ineffectiveness. Poor-quality sites are slow to download or cause problems within WWW servers (Remmers, 1998: [online]).

The WWW environment can be updated or improved, and can feature asynchronous and synchronous capabilities. As there are no time constraints, changes can be made after office hours or whenever needed. Accessibility is not limited and the WWW sites or pages are always readily available. This is an important feature in distance education and especially in elearning as courses can be presented worldwide and the virtual campus or classroom can be implemented fully (Remmers, 1998: [online]).

4.10.5 Cost effectiveness of the WWW

The WWW environment can be very effective, as multiple users can register for and study in a particular course. The initial cost of developing and maintaining a Web page is high, but thereafter it is easy to maintain and upgrade. The greatest benefit to any institution is that the distance between educators and learners can be minimised. This results in a reduction in travelling costs and the less costly presentation of courses. In turn, institutions can deliver a greater throughput of learners, thereby improving the country's overall educational levels.

Replication of information is not costly, since it is easy to update and make additions to WWW pages. This is especially important in countries such as South Africa, which has a new educational system that changes from time to time. The biggest problem is that the initial cost and capital outlay of computers and equipment is very high and prevents organisations from pursuing this avenue. Governments and the laws regulating

elearning and distance education also hamper the process (Remmers, 1998: [online]).

4.11 OTHER TECHNOLOGIES IN ELEARNING

4.11.1 Broadcast television

Television uses VHF and UHF to relay signals from the receiving station to the viewer's television set.

4.11.2 Satellite broadcasting

Satellite broadcasting is the transmission of a broadcast signal from an earth station via an uplink to a satellite. The signal is then processed by a transformer and transmitted via a downlink to a receiving dish. Low-altitude satellites are limited and focus more on storing and forwarding broadcasting. Geosynchronous satellites orbit at a high altitude and are always visible to the receiving satellite dish. This is important for elearning presentations (Collis, 1996:49).

4.11.3 Microwave systems

Microwave systems have various frequency bands and require clear line-of-sight transmission between sender and receiver.

4.11.4 Direct broad satellite (DBS) system

The direct broad satellite (DBS) system transmits directly from the satellite to the receiver's/subscriber's dish. It compresses the broadcast signal to facilitate analogue video more effectively. It is also referred to as compressed video.

4.11.5 Transmissions through a pipeline

Networks can be disrupted due to their bandwidth. Bandwidth refers to the amount of data that the medium can transmit in a given amount of time. Three types are found, namely narrowband, wideband and broadband. Narrowband uses copper wire and data are delivered at 64 000 bits per second. Common uses are voice, data transmission, email and fax. Inquiry and response between terminal/client and host/server and some graphics transmissions are also included.

Wideband uses copper wire with fibre technology and the speed is –1,5 MB/s. It is used for high-quality images, data blocks, LAD, CAM and graphic display networks, picture phone, video-conferencing, wide area networks, as well as computer-to-computer networks (Collis, 1996:40).

Broadband uses fibre and has speeds of 50 MB/s and multiples thereof. It is used for high-definition television, video-conferencing and other image handling (medical imaging).

The Internet works on a set of standards known as the TCP/IP protocol. The best source of the Internet is via the WWW. Elearning can be cost effective if the infrastructure is in place for the necessary transmissions, when a critical mass of learners is being reached and if extra personnel are not needed for extra learners (Collis, 1996:44).

4.11.6 Television

When learning needs to take place the "best technology" depends on the circumstances and on the educator. The educator's notes and the learner's workbooks are excellent tools to accompany educational television. Video recordings are an excellent way to capture lessons and use them at a more convenient time. High-quality, professionally prepared audio and video learning is vital in an elearning situation (Collis, 1996:49).

Radio seems to be the only technology able to reach learners anywhere and at any time. It is also an affordable transmission to distant locations and is still widely used in elearning situations.

Real-time interaction is also referred to as synchronous interaction. Elearning includes the telephone (single voice and speakerphones) faxes and sometimes email. This will soon be replaced with more advanced technologies, such as two-way auditing and visual signals. The only concern is that the cost of two-way video is quite high and some complications, such as a very high bandwidth for transmission, hamper progress in this area. The problem with technologies such as ISDN lines or returns through normal telephone lines is that the analog lines just cannot carry/transmit the vast amount of information and are therefore not suitable for elearning (Collis, 1996:52).

One solution that somehow fails to convert analog to digital signals that need to be compressed. This reduces the time or space necessary to store or transmit information but still leads to jerkiness, especially in video clips containing motion. Audio signals also may not be completely synchronised with compressed video visuals (Collis, 1996:54).

The Internet package consisting of HTTP, Email, News, Gopher, FTP and Telnet HTTP (Hyper Text Transfer Protocol) can only be read by a Web browser. News (as in bulletin boards and newsgroups) is only understood as MNTP (Network News Transfer Protocol). Browsers are much more improved and can deal with all major types of packages. The facilities of the Web offer the convenience of chatting on a telephone together with one-to-one and also one-to-many communication. The user initiates calls and the telephone and the Web are interactive, in contrast with television where there is only one-way communication (Ryan *et al.*, 2000:52).

The Web houses multiple variations of media. It supports real-time chat and real-time audio/video communication, for example Internet Phone, CM/See Me video-conferencing, and asynchronous and synchronous facilities. The links that are supported by an array of media connect to materials and resources that are joined to facilities around the globe (Ryan *et al.*, 2000:54).

4.11.7 Media and interaction

The uniqueness and multiple uses of the Web assist designers to develop learning material of high calibre. Text and graphics are used to make an impact on the various materials that are produced. Frames assist the designer to divide the browser window into several independent parts. Animation and video can be added to show a time dimension between the presented video and reality. Digital sound files with video can be used to enhance location with sound. This can be controlled by QuickTime, which is controlled by the mouse when moving between frames. QuickTime VR or VRML (Virtual Reality Modelling Language) uses interactive three-dimensional abilities, is quick to download and can easily be controlled with Solitaire within the browser (Ryan *et al.*, 2000:56).

The World Wide Web (WWW) has the ability to interact with a range of resources. Certain resources are synchronous (real-time interaction) or asynchronous (a delayed mode of interaction). The advantage of the WWW is not only the media that it delivers, but rather the ability to move between the different media environments. It is important

to remember that the ability of the correct media to support the transformation and communication between teacher and learner, whether synchronous or asynchronous, is a vital ingredient. To distinguish between synchronous (real-time) and asynchronous (delayed or recorded) delivery the use of the different media needs to be understood in order to clarify what is possible in education and what is not (Ryan *et al.*, 2000:54).

4.11.8 Email

Communication tools are an essential component in the delivery of elearning. Email, faxmail and voicemail help to bridge the gap that normally exists in training. As email, voicemail and faxmail lend themselves to being more personal it is also possible to engage in these technologies at any time. Other technologies do not always lend themselves to this type of communication. Another advantage is chat communication through email, faxmail and voicemail, which is a form of one-to-one communication (Porter, 1997:104).

Electronic mail (email) is also one of the simplest yet most effective tools, as a whole distance education programme can be forwarded to prospective learners. Previous distance education courses (correspondence courses) can act as example whereby course materials and correspondence to educators can now be sent electronically, making email much faster and cheaper. A large number of educators can also be reached simultaneously. Faxmail combines the best of email and faxed communications. It is not a common feature in distance communication but can be used effectively in future. Voicemail is not used as primary method to engage in communication, as voicemail messages are complex and expensive. It can, however, act as a supplement in more personal communication or be used for discussing particular assignments with learners that have difficulty with certain aspects of the work. Voicemail can also be attached to documents so that educators and learners can hear each other. It can also be effectively used as tool for persons with visual impairments and other disabilities (Porter, 1997:104).

All these tools can be incorporated to assist in making elearning more functional and efficient. The correct technology and the use of more technologies will enhance not only the quality, but also the delivery of distance education courses and elearning in particular.

Email is very flexible as a tool. o connect users in-house or across the Internet. Email can be sent to users through a local area network (LAN) linking all employees or learners with the host. This tool lends itself to many users within geographical areas or within institutions (Porter, 1997:104).

4.11.9 Email applications

Email can be used as primary means to transmit course and other important information. Email messages, mailing lists, discussion groups and multiple user domains (dimensions) or MUDs can be used to facilitate and supplement other types of instruction, especially in electronic learning (Porter, 1997:105).

Email is a handy tool in video-conferencing as it can be sent in conjunction with or after conference times. During a video-conference or in MUD several users can converse at the same time. Email is, however, often used and perceived as a more personal, immediate and private form of communication. Email is more flexible in use than other distance learning technologies, as it is fairly inexpensive (Porter, 1997:105).

Email has another important role to play where it is used extensively for "conversation" outside the traditional classroom. It is an ideal method to use in elearning as it can be used at any time, in any place, and at the learner's own pace. This embodies many characteristics of elearning. It is ideal to use especially for distance education learners who are mostly engaged in learning at all times. Most learners are adults and also have different time schedules. Email can also be used to interact with instructors after courses or lessons, enabling the learner to ask questions or go over the particular emails, whereas this is not possible in the traditional face-to-face classroom situation. Email can be used immediately as the learner generates questions and thoughts. The lecturer can then respond at a later stage or immediately. Email can also be saved and sent to other users with documents attached. This makes email ideal in distance education and especially in elearning (Porter, 1997:105).

Email from many learners can be read and problem areas defined. A response can be sent to assist learners. Assignments can be assessed and responded to immediately. Learners can be assisted to find other information or be assisted personally. Email enables the educator to help learners at his own convenience. Email also encourages learners to participate more freely in the learning process, as it is interactive. Lecturers and other learners can be approached for advice. Email also assists learners with disabilities who cannot always find ways of reaching lecturers. It also removes the

stress of approaching lecturers d arners feel threatened or shy or are incapable of approaching lecturers due to personal problems (Porter, 1997:106).

Emails are also brief and direct and are sent quickly and spontaneously. This encourages learners to send more messages. This also forces lecturers to understand learners better and to see different interpretations of the work presented. Problems can easily be understood and learners assisted early to prevent pitfalls. It is ideal as learners can request more assistance and ask more questions. More interpersonal dialogue can take place as the time factor plays an insignificant role. Email expands time for discussion, as it can be accessed offline. Discussion can now be taken directly to others as often or as seldom as needed. Emails can be used formally to send notices to groups or individuals, including progress reports, reading lists, basic course information, electronic questionnaires and much more. Sent messages can be stored, deleted or printed. Elearning uses email as main tool in distance education courses, because of its versatility, speed and applicability (Porter, 1997:106).

4.11.10 Faxmail

Faxmail is a technology that resembles email and voicemail. It allows educators to send or receive messages at any time. An electronic address is used as "voicemail for faxes" and the information is then accessed by means of a fax machine or fax modem. It allows for messages to be sent or received via email even if a computer is not nearby. A fax machine is the only instrument needed to receive the documentation. Problems in the use of email can arise especially with long documents that are difficult to attach to email messages; however, faxmail can overcome this problem, especially with long documents or documents with graphics. Faxmail can successfully be used among educators and learners in distance education. It is a supplement to other types of communication including email and voicemail (Porter, 1997:122).

4.11.11 Voicemail

Learners and educators can be put more personally in touch with this type of communication. Most telephone systems allow for recording and can be used to record voicemail messages at any time or place through the telephone. Like faxmail, voicemail can be accessed at any time without the assistance of a computer. It is an ideal tool for users who do not have access to email. A disadvantage of voicemail is the limitations insofar as time is concerned, since the message can be too long for the time allowed for recording. Effectiveness in communication or the lack thereof

determines the success of voi ed, tone of voice or other vocal mainstreams can influence the success and usability of voicemail (Porter, 1997:122).

When combined, email, faxmail and voicemail can be used effectively in distance education courses. Learners can benefit by using these tools with minimal practice. Communication can easily be accessed depending on the electronic appliances available. These technologies can be used independently or simultaneously to facilitate good communication between lecturers/trainers and/or learners. Learning differs and is performed differently amongst learners. To be effective the delivery of an elearning course needs to be adapted to the needs of each learner, since each learner will have different goals and will use different ways and paths to accomplish these goals (Bruslowsky *et al.*, 1998 in Furnell, Evans, Phippen & Abu-Rgheffi, 2001: [online]).

The greatest benefit of elearning is that it encourages the learner to access the appropriate expertise and resources irrespective of distance. This method is ideally suited to the needs of adults who are fully occupied in their workplace during the day. Another benefit is that whenever a need arises in any business or educational environment it can be catered to and tailor-made to suit that particular organisation by means of elearning. The use of technologies such as the Internet and the WWW opens avenues for improved interaction between learners and institutions (Furnell *et al.*, 2001: [online]).

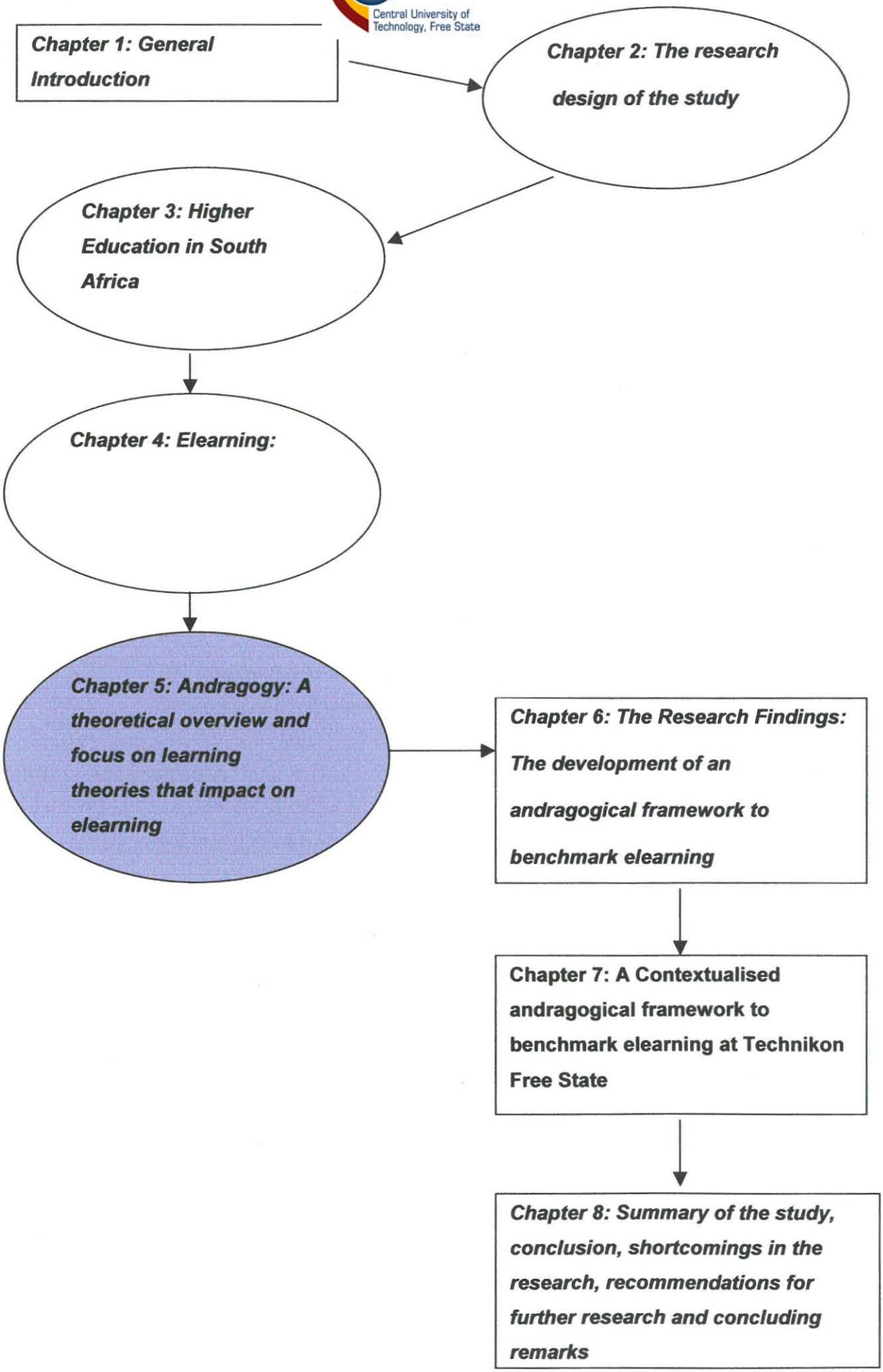
4.12 SUMMARY

This chapter has discussed the many angles possible and the benefits available to educator and learner via elearning. It is important for higher education institutions to embark on elearning as quickly as possible in order to remain globally competitive. The next chapter will focus on andragogy, which forms the basis for the development of a framework for elearning to be implemented by Technikon Free State.

Central University of Technology, Free State

5

CHAPTER FIVE



ANDRAGOGY: A THEORETICAL OVERVIEW AND FOCUS ON LEARNING THEORIES THAT IMPACT ON ELEARNING

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ANDRAGOGY: A THEORETICAL OVERVIEW AND FOCUS ON LEARNING THEORIES THAT IMPACT ON ELEARNING

5.1 INTRODUCTION

South Africa's conventional educational system is at technological level not capable of meeting the country's massive educational needs as many rural areas lack the supportive infrastructure. The structure of the system and the practices it is based on can create many barriers for learners. A system needs to be put in place to ensure quality lifelong learning. This system needs to address the needs of South Africans who were deprived of educational opportunities in the past, and also to ensure that the challenges of current problems and issues of education are addressed. It needs to provide opportunities for the youth, but must at the same time address the question of adult education. A system for the twenty-first century has to be put in place to ensure proper education and training that is comparable to international standards (NCHE, 1996: 5; SAIDE, 1994c:1).

As indicated in previous chapters, elearning can assist in the provision of quality learning to adults in the South African context. Technikon Free State has instituted an elearning programme. In order to provide benchmarks for this programme, one of the aims of this investigation is to provide guidelines derived from the principles of andragogy. As a first step, an investigation on the impact of learning theories in elearning needs to be done so that the principles applicable to elearning can be incorporated in the proposed andragogical framework for elearning.

The word 'andragogy' is derived from the Greek word *aner* meaning 'man' and is a term given to a methodology for teaching adults (Knowles, 1990:55). Andragogy has only recently been applied in the educational arena. According to Van Enckevort, a philosopher, a German grammar school educator, in 1833 first used the term "Androgogik". Plato, the Greek philosopher, was the inspiration behind this educator's description. Van Enckevort observed that a more renowned German philosopher Johan Friedrich Herburt opposed the use of the word, causing its disappearance for nearly a hundred years, when it resurfaced in Yugoslavia, Holland and France in 1921. However, in these countries "andragogy" was used to refer to the study of the science

and processes of adult educat | means of helping learners learn (Knowles, 1990:51; compare Learnativity, 2001:3).

Malcolm Knowles introduced the andragogical model, as we know it today, in 1980. This earned him the title "father of adult education" ; not because he invented the term andragogy but because of his popularisation of the concept. According to Mynen (2001:2), Knowles worked for over thirty years in the field of adult education and experimented with different learning styles, techniques and strategies in an environment suited to adults. Knowles was opposed to a lecturing system and promoted working in small group settings in the educational environment (Jarvis, 1995:90; Mynen, 2001:2; Carlson, 2003: [online]). The reason for situating this study within an andragogical framework is that 'andragogy' is specifically concerned with adult learning and the majority of students at the TFS can be considered as adults.

However, the study of adult learning is to be accompanied by a study of learning in general and therefore it is important to understand the principles of learning and how students learn. The development and presentation of elearning materials should be based on such sound learning theories. The effectiveness of learning materials and the design of the course determine the effectiveness of learning and is a prerequisite in the quality of learning (Rovai, 2002: [online]). A combination of theories can be used to develop and design course materials to select the best theory and most appropriate instructional strategies.

The following theories namely behaviourism, cognitivism and constructivism are discussed in this chapter as main theories in the development of elearning materials. Although many overlaps exist in the philosophy and principles of behaviourism, cognitivism and constructivism, each of them contributes in their own unique way towards an understanding of learning. Ertmer and Newby (1993:50) propose that all three schools of thought can be used in instructional design whereby behaviourists' strategies can be used to teach the "what" (facts), cognitive strategies the "how" (process and principles), and constructivist strategies the "why" (higher level thinking that promotes personal meaning and situated and contextual meaning). The theories are discussed below.

Apart from discussing three main theories on learning, this chapter aims to identify andragogical principles that can serve as a basis to establish a theoretical background to benchmark elearning at Technikon Free State. Equally important is that andragogy

(the art of helping adults learn) ar of the proposed framework for benchmarking elearning. In short, the aim of the chapter is to give an andragogical theoretical overview and to show the interaction with some learning theories and supportive arguments why andragogy should be used to benchmark elearning at Technikon Free State.

5.2 LEARNING THEORIES THAT IMPACT ON ANDRAGOGY

The following section focuses on theories of learning that have an impact on adult learning. The theories selected all contain elements supportive of andragogy. It is crucial that these elements be incorporated as part of the andragogical framework for elearning as they are not only supportive in elearning, but are essential in an andragogical environment like Technikon Free State.

Kolb (1984: 8) found that people learn in four ways. Some learners tend to stay with one way while other move between modes of learning. Of importance is that adults prefer to learn through concrete experience, through observation and reflection, through abstract conceptualisation and through active experimentation. A learner-centred approach will increase learning if facilitators utilize the learners' experiences and previously acquired knowledge as part of the learning process. Methods need to be developed, as it is an important element in elearning in which learners interact and reflect on subject matter. Learning by doing or taking action in the learning process is referred to as experiential learning by Kolb (1984: 9).

Andragogy shares similar characteristics with experiential learning whereby learners are actively involve in the learning process. As elearners, it is important to interact with mutual learners and facilitators as new knowledge is created and a move towards independency through creative thinking is initiated. New knowledge is constructed and meaning is found through constructivism of the related world by means of the learners' interaction with peers and study materials. As experience is so important to adults, adults demand the relevance and application of learning tasks and materials. This needs to be tested against their previously acquired experience and knowledge. Facilitators of elearning have to consider andragogical principles when planning any learning event. Andragogy, constructivism and experiential learning share common elements that are used to benchmark elearning (Kolb, 1984:6).

The following section contains aspects of adult learners that are important to support the andragogical assumptions as postulated by Martin Knowles. Each of the theories

contains important principles th essential in the benchmarking of elearning.

5.2.1 Behaviourism

Many self-instructional offerings in education are directly based on behaviourist theories (Merriam & Caffarella, 1991:137). Many applications for learners have grown tremendously over time and include programmed instruction, computer-assisted instruction and personalised systems of instruction (PSI). These have proved vital and have played a significant role in educating off-campus (distance education) learners. The rationale behind this type of learning is the behaviourist application where learners are rewarded for correct responses and behaviour (Cross, 1981:232). Learning is a change in observable behaviour caused by external stimuli in the environment (Skinner, 1974 in Meyer, Moore & Viljoen, 1988:191). It is the behaviour of the learner that dictates whether learning has taken place or not. Some educators indicated that not all acquired learning is observable and a change in behaviour is not always measurable and neither observable.

Observable behaviour according to Good and Brophy (1990:15) are indicators of learning. In elearning learners should be told the explicit outcomes of each lesson. This is well suited and applicable to Outcomes-based Education and elearning outcomes for each lesson, module or for the course objectives. Testing or assessment should be done and the competency of learners determined. Adequate feedback and reinforcement can be done. Learning intervals should be graded and a move from simple to complex, known to unknown and knowledge to application should be followed (Anderson & Elloumi, 2003:8).

As indicated behavioural instruction needs to be observable, measurable and have controllable objectives. The instructor sets the criteria. Other requirements are set by the requirements of the qualification as laid down by the institution. In elearning behaviourism can be used through multiple task setting to see whether learners have reached the desired outcomes as required. Tasks need to be broken down in small, measurable chunks. This is an important feature in elearning that caters especially for e-learners. The behavioural approach is educator-centred and task-oriented. If variation in the workplace is needed a different approach is needed (Learnativity, 2001: [online]). One such approach that adds a new dimension to learning is cognitivism.

5.2.2 Cognitivism

Cognitivists view learning as an internal mental process. The developmental phases in the adult's path of learning are important as information storage and retrieval form part of such mental structures. The learner is to develop skills to learn better. The educator according to the learning activity structures learning content. Learning manifests itself in cognitive development. Intelligence, learning and memory act as function of the learners' age. Learners learn how to learn. The mind is the centre of learning and must make sense of stimuli it receives from the environment and through the senses. The storing, processing and retrieval of information are important aspects for cognitivists (Merriam & Caffarella, 1991:137).

A cognitivist approach towards learning focuses on the internal processes, namely memory, thinking, reflection, obstruction, motivation and meta-caption. Learning is seen as an information-processing process whereby different types of memory are used during learning (Anderson & Elloumi, 2003:8). Such information needs to be stored immediately to prevent a loss (Kalat, 2002:5). Learners, to facilitate storing and processing of information can assess small chunks of information.

Cognitivists describe learning as the building of an internal scheme (knowledge structure) or the change of an existing scheme of past learning of events. Learning is seen as a developmental process based on prior experience, knowledge and expectations. Knowledge is manipulated to solve problems and to change novices to experts. The crux of the matter is to control and maintain one's own thought processes. This element of expert performance is referred to as metacognition (Learnativity, 2002: [online]).

Metacognitive skills are essential in problem solving and control of learning. It is probably the most important of lifelong learning skills. Programs need to be metacognitively aware, informed and explicit (Learnativity, 2002: [online]). Important is that the different learner styles be accommodated through the learning strategies available in online instruction (Anderson & Elloumi, 2003:14).

The cognitive style of a learner refers to the way of processing information and it is essential for designers to take this into consideration when designing elearning materials (Kolb, 1984:20). Different activities need to be based and designed on different learning styles (Anderson & Elloumi, 2003:15). Information should be presented in different modes to cater for individual needs. Learners should be

motivated through intrinsic and e s. Attention, relevance, confidence and satisfaction are elements to consider (Anderson & Elloumi, 2003:16).

Strategies for online learning should be adopted to store information in the long-term memory of the learner for future use and reference. The relationships between concepts in topics and the relationship between major concepts should be included in elearning materials. According to Anderson and Elloumi (2003:10) the following strategies can be included to assist students in generating such cognitive structures:

- Learners should be allowed to perceive and attend to information by using maximum sensory systems. Important information should be placed in the centre and allow reading from left to right. Important factors should be highlighted. The outcomes of each lesson should be clear and the importance of "why" it should be known emphasized. Material should match the cognitive level of the student to reuse and further investigate and assimilate more complicated materials.

- Strategies should be followed to extract existing information from the long-term memory to be applied to newly acquired knowledge and to build bridges between the types of information. An organised presentation of materials (knowledge) will assist in this process. Mental maps can be made with the assistance of summaries. Details of existing knowledge should be presented to join with new knowledge through prerequisite preparation and test questions. Prerequisite learning can also be done or given before the study of new materials. The concept to move from the known to the unknown is applicable as well as from easy to difficult.

- Chunk information to prevent overloading by organising the materials in sub-items as part of the whole lesson. Importantly, the relationships or holistic map should be provided. Summaries or lessons can be offered by using information maps, through the various software available.

- Higher-level learning must take place through real-life information by means of applying, analysing, synthesizing and evaluating strategies in order to facilitate deep processing of information.

As individuals differ from one an learning strategies must be used to suit the different learning styles of students that are suited to their different learning environments. This is an important point, especially in the South African context, where huge differences exist between the different cultures and the vast majority of languages that are found (Kolb, 1984:20).

Elearning can cater for individual differences by determining the learners' preferences of what they are interested in. Adults prefer a certain way in processing information and have a particular mode of thinking, remembering or problem solving. A learner's cognitive style needs to be understood in order to design and develop learning materials (Anderson & Elloumi, 2003:15).

Cognitive models give learners control by supplying them with conceptual frameworks and by relying on both representational and discovery learning. Learning is seen as a developmental process and new knowledge is acquired by focusing on prior experience, knowledge, and expectations through the building of bridges. The previously acquired knowledge base of a learner will determine the level at which newly acquired knowledge is presented. An important feature is metacognition whereby learners must develop the ability to think about thinking, to be consciously aware of themselves as problem solvers, and to monitor and control their mental processing (Learnativity, 2001: [online]).

5.2.3 Constructivism

Constructivism emphasises the building or construction that occurs when people engage in learning activities. The idea behind constructivism is that people learn better by active engagement in learning and to reconcile new information with previous schemas of stored information (Smerdon & Burkam, 1999:2). Learning is seen as an active process of combining information and constructing a unique mental image through the use of our senses (Bencze, 2003: [online]). Constructivism is a philosophy of learning based on the understanding of the world we live in according to our own perceptions, experiences, rules and mental models (On Purpose Associates, 2001: [online]). Constructivism is based on the premise that we construct our own perspective of the world, through individual experiences and schema. The learner is prepared to solve problems in situations that are ambiguous in nature (Mergel, 1998:2).

Constructivism is focused on knowledge and what we make of it. Learners do not merely absorb and store information, but make tentative interpretations of experiences

(Kenneth, 2003:6). These interp tested against previous experience and knowledge and tested to make meaning or to be applied (Learnativity, 2001: [online]). Learning is an active process whereby learners construct new ideas or concepts based upon newly acquired knowledge or previous experiences (Hein, 1991:1). Cognitive structures assist learners to transform information, construct hypotheses and make decisions that allow for predictions and applications beyond what has been received. Facilitators of learning should encourage learners to go beyond the given and discover principles themselves (Bruner, 1990:10). In this regard learners must be prepared and willing to engage in learning by the appropriate experiences and contexts of learning. Instruction must be structured and organised for easy interpretation by the learner. Instruction should be designed to facilitate extrapolation and move the learner to new fields of discovery (Bruner, 1990:13).

The construction of knowledge does not take place in isolation, but also embraces the social environment of the learner. The learner constructs meaning and that is learning. Information is not merely absorbed and stored but tentative interpretations are made of acquired experiences (Learnativity, 2002: [online]). Jonassen (1991:28) focuses on advanced knowledge and stipulates that cognitive learning environments can effectively transfer basic skills and assist learners to attain advanced knowledge based on well-defined and available knowledge. Validation of newly acquired knowledge can be done through social negotiations.

In constructivism the natural complexity of a subject is investigated through multiple perspectives. Tasks and opportunities, information resources, support and encouragement are given to learners to let them construct their own version of their perceptions. Computers are ideal tools, as they possess many angles to acquire information. The constructivist approach towards learners is learner-centred. Learners are actively engaged in creating meaning to context. Problem solving, case studies and the creation of meaning are critical in constructivist learning approaches (Dodge, 2001: [online]). These principles support andragogy and outcomes-based education. Rutherford (2001: [online]) explains that learners bring prior knowledge and experience to class and can use this to interact at a level that is appropriate.

As part of outcomes-based education learners are to explore ideas and to construct knowledge that is based on their own observation and experiences (Smerdon & Burkam, 1999:2). Learning is a more open-ended experience in constructivism. Methods and results of learning are not easily measured and learners have different experience of the learning content and environment (Mergel, 1998:18). According to

Dewey (1938) adults should b edge and instruction on previous experiences. Higher order thinking and problem-solving strategies must be incorporated into the learning process through facilitator participation (Smerdon & Burkam, 1999:2).

When applying constructivism in a learning environment certain dispositions are supported by a learner-focussed approach, namely:

- Education should be experienced based. Learners should join theory and apply it practically.
- Learners are individuals and have unique characteristics that should be catered for when planning learning activities.
- The learners' perceptions should shape the curriculum
- The natural inquisitiveness of learners should be fed and nurtured
- The learners' circumstances and emotional state should be accommodated
- A learning environment free from scolding and fear should exist (Kenneth, 2003:6).

Adults have specific needs in learning and want to be actively engaged in learning. Adult learners in conjunction with their respective facilitators of learning, should structure their learning around the achievement of the goals as set by the programs they engage in.

Social interaction, according to Vygotsky, a theorist (who developed a theory on social cognitive development) plays an important role in the development of cognition. Of importance is that students need to interact in elearning and elearning carries that potential. Vygotsky refer to this potential for development as the "zone of proximal development". The zone of proximal development (ZPD) refers to the stages that range from the lower limit of what learners know to the upper limits of what the student has the potential of achieving (Kearsley, 2004: [online]). Another theorist, Bandura, adds to the social learning theory of Vygotsky. He emphasises the importance of observing and modelling the behaviours, attitudes and emotional reactions of others. Adult learners learn through interaction from one another through modelling that culminates and act as a guide for action. It is important to note that elearners are motivated to interact with another. An important principle of andragogy is collaboration. The end product is social consciousness (Patsula, 2004: [online]).

An important aspect is that learne ly engaged in learning activities and must be supported in reaching their set goals and outcomes. In elearning the necessary guidance and support can be made possible through many interactions between facilitators and learners, and between learners and learners. The aim is to move the learner from the lower level to the upper levels of their zone of proximal development. All the technologies in elearning and support structures can be used to move the learner to upper levels and in doing so, a level of independency is systematically reached. Social interaction is required to reach full cognitive development and is only restricted to a certain range at any given age of the learner (Patsula, 2004: [online]).

Radical constructivism is an unconventional approach to the problem of knowledge and knowing. It assumes that knowledge is found within the mind of a person and that the construction of knowledge is based upon previously acquired experience (Anonymous, 2004: [online]). Radical constructivism is built on two principles according to Bodner and Geelan (2004: [online]). Knowledge is not passively received and is actually built by the individual. Cognitive organisation takes place and meaning is assigned to the activity. The emphasis falls on discovery learning, learning in complex situations, learning in social contexts and distrusting systematic evaluation of educational outcomes. Radical constructivism has many similarities with andragogy and outcomes-based education, *inter alia* that learning is an active process and the learning-teaching process is interactive. Elearning requires learners to be interactive.

Radical constructivism postulates that knowledge is personally constructed through socially accepted and shared notions through active engagement. Different perspectives are found in solving problems as individuals experience and understand knowledge through their own perceptions. Facilitators of learning have to facilitate and guide learners to organise learning materials according to their personal schema. An important feature is that facilitators must allow learners to create the knowledge they need. Interaction between learners and learners, and learners and facilitators are encouraged. Skills are developed and improved through active engagement (Boudourides, 1998:1).

In the application of learning principles according to Vygotsky (1978:15) learning is a collaborative and social activity. The educator acts as facilitator and guides the learners to construct their own understanding of the learning situation and content. Learning is seen as a process. The zone of proximal development can be used to design appropriate learning situations and act supportively for optimal learning.

Learning must take place in situa that are meaningful and integrated. All experiences should be linked to learning activities to bring about a sense of oneness between the learner, his/her environment and the community by keeping the educational level of the learner in consideration. Vygotsky viewed this process as a lifelong process that is dependent on social interaction.

Knowledge, according to constructivists, is "what we make of it". Learning should have meaning, must have actions involved, be lasting and become a working knowledge of culture. Basic skills can be transferred to assist learners attain advanced knowledge, provided that the information is available, well defined and the learner is able to process such information (Learnativity, 2001: [online]).

Constructivists focus on situated learning that is contextual in nature. Learners are active participants in the acquiring process and learning is learner-centred. Instructors are facilitators in the learning process rather than transporters of knowledge. Skills, attitudes and values are essential components in reaching the desired outcomes of lessons presented and improving the learners' ability to adjust to the new way of constructing his own knowledge (Ally, 2004:18).

Elearning learners are active rather than passive, performing meaningful activities resulting in meaningful activities of high-level processing that facilitates, the establishment of knowledge and personalized learning. Constructivists in elearning, like Ally (2004:19) has developed learning materials and designers, focus on the following aspects:

- Learning should be an active process whereby learners should acquire and interact with information on a practical level.

- Learners should construct their own scheme of knowledge, rather than being passive receivers thereof. First-hand experiences of informal materials presented lead to opportunities to contextualise and personalise information.

- Real life experiences, collaborative learning and cooperative learning should be facilitated through constructivist learning approaches and the application of metacognitive skills. Adult learners can share in each other's life experiences. Learners with equal strength levels can be grouped to encourage cooperative learning.

- Learners should accept responsibility and be autonomous in the learning process. They should be given control and make their own decisions in acquiring materials to reach the desired goals or outcomes as expected.

- Time and opportunities must be given in order for learners to reflect and internalise information in order to discover relevance and meaning.

- Learning must be meaningful to learners. Adults' study materials should be relevant and meaningful. Designers should choose meaningful activities.

In this section an overview of three main theories of learning was offered to provide an educational framework for understanding andragogy. The implications and applications of these theories to elearning were also discussed. To understand how adult's function and fit the learning profile, a definition of the term *adult* is explained, followed by a more detailed exposition of the concepts andragogy and andragogical principles that could serve as benchmark for elearning.

The above literature explained the importance of the learner in the different constructivist approaches to learning. It is important to see the learner as central in the learning process. The next section focuses on aspects, terminology and characteristics of adults as learners.

5.3 AN EXPLANATION OF THE CONCEPT ADULT AND THE UNIQUENESS OF ADULTS AS LEARNERS

5.3.1 Adult

It is important to understand the term 'adult', because adults are the learners referred to in study and are usually involved in elearning programmes at Technikon Free State. The current transformation in higher education caused by economic situations, changing learner demographics and the influence of information technology, indicate a rise in enrolments of adults in higher education institutions. Higher education institutions have to rethink teaching strategies, approaches and methods to deliver quality education (Ryan & Serdyukov, 2003, [online]). In this section I shall discuss the concept *adult* and how it is related to elearning.

Knowles (1998:57) defines an ad ur criteria. The first is biological: an adult is a person who has reached the age of reproduction early in adolescence. Secondly, according to the legal definition, a person is an adult when the law states that he/she can vote, obtain a driver's licence and marry without consent. The social definition of an adult is that the person adopts adult roles such as that of a spouse and parent. The psychological definition claims that adulthood starts when a certain psychological view or perspective is arrived at – this is the stage when self-direction and the awareness of taking responsibility for one's own life are established. From the viewpoint of learning, the psychological view of an adult is the most important and forms the basis of andragogy as theory of adult learning.

5.3.2 The uniqueness of adult learners

It is clear that adults learn and should be taught differently from children (Sipe, 2001:88). The learning style must correspond with the individual learner's level of development. The motivation, capability, experiences and skills all play a major role in the way in which learners should be taught (Merriam & Caffarella, 1991:306). Adults have been out of the educational system for a while, and are quite different in their approach to the formal educational environment. Methods need to be adapted and skills must be upgraded in order for learning to be successful (Rodgers, 1996:76; Olivier, 1998:37).

Learning is voluntary and involves making individual decisions (Rodgers 1996:77). It implies that some form of change is taking place in the individual. This means that a change in behaviour is associated with this process. However, not all changes mean that learning is taking place. Learning is active, and not a mere passive acquisition of knowledge and skills. It also implies a personal approach and differs from individual to individual (Rachel, 2002:214).

5.3.3 Dynamics of adult learning

The domain of all learning includes the acquisition of attitudes, knowledge and skills. Lewin (1935), Bloom (1956) and Gagné (1972) all agree that learning is very complicated and encompasses motivation, skills, understanding and interest. It is also their opinion that a clear distinction exists between learning as cognitive domain and learning as affective domain (Rodgers, 1996:78; Olivier, 1998:37).

Learning does not only occur ...ut in the everyday environment. Unfortunately learning and education are easily confused. Lifelong learning is continuous with or without help from others, whilst education involves learning. Not all learning is educational or valuable. Learning happens all the time while people are conducting their daily affairs (Olivier, 1998:37).

Learning co-exists with experience. The social and physical environments steer and act as background to learning. Learning is personal and individual with the social and cultural background acting as guides in and barriers to the gaining of knowledge. Most of this learning is unintentional, although much learning takes place as a result of deliberate intention e.g. posters, television and pamphlets. Reaching goals acts as focus to stimulate the individual towards focusing his/her attention on that particular goal (Rodgers, 1996:80).

Adults are usually self-directed learners and their purpose is short-term as well as long-term goals that need to be achieved. In fulfilling such goals, the aim is to solve particular problems and to reach a specific goal. From these goals conclusions are made and implemented. Learning is specific in nature. The aim is to relieve pressure and to find immediate and particular solutions that will yield results in the short term, and not necessarily in the long term or in general (Rodgers, 1996:85; Olivier, 1998:37).

Having provided a general background to adults and the uniqueness of adults as learners, a more detailed discussion of andragogy now follows.

5.4 ANDRAGOGY

Andragogy is defined as "the art and science of helping adults learn". An important focus of andragogy is that education is learner-centred (Knowles, Holten & Swanson, 1998: 64). Van Enkevort (in Long, 1991:74) defines andragogy as " any intentional and professionally guided activity that aims at a change in adult persons". According to Jarvis (1990: 22) various definitions exists and andragogy in Holland means the overall study of social work, community organisation and adult education. Gravett (2000:65) adds that "andragogy" is often used as synonym for adult education. Andragogy as concept is sometimes used as formulated in a theory or as a set of assumptions and guidelines or hypothesis for adult education practice.

Conner (2003: [online]) defines andragogy in a broader context and refers to learner-focussed education for people of all ages. Merriam (1998:10) adds that andragogy is

based on the assumption that ad ed, want to learn and grow out of a need. This needs stem from their unique and personal experiences gained during their development. In addition, Burge (1998:4) describes andragogy as a process of adult learning. Andragogy is the name given to a teaching process designed for the adult learner and the adult education educator. In such situations learning should be problem-centred and the instructor a facilitator of learning instead of a transporter of knowledge (Hiemstra, 2003: [online]).

The following section will focus on adults as learners and why the facilitators of learning must take cognisance of when developing or presenting elearning.

Andragogy has a direct bearing on how educators in elearning should approach learners (compare Ryan & Serdyukov, 2003, [online]). Adult learners are seen as differentiated learners. Andragogy places the learner as central focal point in the learning process and emphasizes the self-directedness of adult learners (Merriam, 2001:5).

Adults, according to Knowles (1990:63), need to know why they learn something and how this knowledge will assist them personally or professionally. Learning or the knowledge required will improve the quality of their lives, will make a contribution to the work they are doing as adults. This need-to-know aspect focuses also on what adult learners see as essential components; of how the information learned is linked with real life and the life they are living. It promotes internal motivation and leads to success or qualifications that in turn will bring more motivational aspects to the fore. These achievements will lead to an improved self-concept that will lead to self-direction and independence. Learners develop a self-directed approach to learning and will move away from the dependency on educators. A learner who has achieved this status also applies and utilises his own learning experiences and that of others to be more independent. This feeling of independence improves motivation and vice versa. It assists the adult learner to be ready to assimilate more difficult tasks and promotes his/her readiness to approach new tasks and assignments and to explore the unknown, because a solid basis and array of knowledge empowers him/her to do so (Knowles, 1990:60).

The andragogical model (Merriam, 2001: 5) is based on several assumptions. Adult learners, like children, need to know why a particular area of learning is addressed or not. Another important feature is that they must know what gain or compensation is associated with the task before it will be completed. For adults, the benefit of most

learning lies in the knowledge the is can help them, or in how it can be applied. At school, children usually learn because they will receive marks, get a diploma or because they are rewarded in some other way (Carlson, 2003: [online]). A learner-focused model of teaching, aimed at real-life applications is supported by the assumptions of andragogy. Another important distinction is that adults are often motivated internally (Knowles, 1993:58; Rutherford, 1999: [online]).

An andragogical approach, according to (Ryan & Serdyukov, 2003, [online]), requires learners to be actively involved in learning. The learner determines the time, place and pace of learning. Children do not have the vast learning experiences that adults are likely to have, and the latter therefore bring a vast amount of life experiences into the learning environment. Adults are needs focused in their seeking of learning and the programs they enrol for. This last point has an enormous influence on the motivation of adult learners, because they select their own learning programs (Slotnick, Pelton, Fuller & Taylor, 1993: 6).

5.5 THE DIDACTICS OF ANDRAGOGY: THEORY TO PRACTICE

The focus of didactics is the particular instruction used in particular subjects (or fields of study) to assist in the process of learning (Fraser *et al.*, 1993:6). Didactic activities related to education focus on activities of teaching and learning that are directed at a person's mind and cognition in his/her quest towards knowledge. The aim of all learning is to present learning content in such a way that the learner obtains knowledge and skills (Terehoff, 2002: [online]). Once these are acquired a learner will become competent in obtaining, interpreting and using knowledge and skills in order to become mature. Didactic activities take place in different didactical situations, characterised by learners' needs and expectations. Adults learn because they want to (Fraser *et al.*, 1993:9).

The main aim of the didactics of andragogy is for educators to know how to help a learner learn. The main assumption is that andragogy is not determined by the need for a theory of teaching but rather one to facilitate learning. Gagné (1972:19 in Cross 1981) adds to this by implying that andragogy is closer to a theory of learning than to one of teaching. Andragogy focuses on the education of adults and what can be done to help adults learn. In short, the most important issue is that andragogy identifies characteristics of adult learners and has gained the attention of practitioners who are concerned with investigating avenues for pursuing this theory.

It is important to develop a fram e adult learning. Andragogy lends itself to the adding of value and to helping adults learn. According to UNESCO (1998) a call has been made to restructure the existing system of education, to develop all educational potential to its fullest and to develop learners into self-directed learners who would serve their own education better (Sipe, 2001:87). This calls for adults to be lifelong learners and to pursue all aspects of self-fulfilment. This new focus must be implemented as we are living in a technology-driven society that changes rapidly. In order to survive one needs to stay in touch and keep pace with development and changes. Andragogy is an ideal way of assisting learners to acquire skills to empower them to keep up with the progress to be made (Cross, 1981:259).

To achieve certain goals or expected outcomes, educators must set effective outcomes to be achieved. These outcomes will vary amongst learners and planning is essential in order to achieve these goals. Andragogy has raised much awareness that a need has arisen for the separate and enhanced provision for adults as learners, and the fact that the focus should be on outcomes for adults rather than those methods used to educate children (Thorpe, Edwards & Hanson, 1993:6).

The following two sections contain a discussion of principles that need to be incorporated into the framework for elearning, as they are the assumptions that andragogy is based upon.

The following discussion will further clarify the central assumptions of an andragogical approach to learning.

5.5.1 Informed learners

Adults need to know why they need to learn something before starting to learn it. Many learning activities reside within adult learning and learners themselves (Gravett, 2000:65; Merriam & Caffarella, 1991:249). Adult learners also interact more during group discussions, simulation exercises, problem-solving activities, case studies and laboratory methods. Peer-assisted activities should also form part of the adult education programmes. Adult learners come to learning activities with their own ideas, mindsets and ideologies (Caffarella, 1994:24). Adults tend to be more successful if they assist in planning a learning activity (Hiemstra, 2003: [online]). Learners who engage in an andragogical way of learning will find their self-identity much sooner in life and will also show more maturity within a shorter period of time (Knowles, 1993:60; Knowles, et al., 1998:64).

Adults focus their attention on life situations that have meaning and that apply to themselves. These problems are either task- or problem-centred. Adults will learn whatever that will assist them to do something better, or to bring about an improvement in their lives. New ventures are also undertaken to improve life situations that are applicable to life contexts and real-life situations (Knowles, 1993:60; Rutherford, 1999: [online]; Knowles et al., 1998:64).

Adult learners participate voluntarily according to their own needs. Knowles (1990), in Rodgers (1996:60), claims that adulthood is attained at the point of time when a person sees him/herself as self-directing. The social climate or culture plays an important role in this respect. For example, in some cultures women are deprived of access to education. It is important that the educational process should coincide with the process of reaching maturity. Learning is hindered if adults are treated like children in their endeavours to learn (Merriam & Caffarella, 1991:87). Adults who feel like children in the classroom tend to be rather passive and show less security in as far as their responsibility and goals towards their own learning process are concerned (Rodgers, 1996:60; Knowles et al., 1998:64).

Adults question new knowledge as they compare it with experiences and knowledge previously acquired. If mistakes have been made adults can rectify them. Adult learners can also assist each other as they can all benefit from each other's learning experiences. This will not only bind group members more strongly together, but will enrich each adult learner taking part (Rodgers, 1996:65; Rutherford, 1999: [online]).

5.5.2 Self-concept and taking responsibility

The self-concept moves from educator dependence to self-direction in the learning process. Adults have a self-concept of being responsible for their own environment and destination in life (Merriam & Caffarella, 1991:249). The self-concept needs to be developed to reach self-actualisation. In doing so a move away from dependency needs to be followed (Knowles et al., 1998:64). As a person matures, the self-concept moves away from learner dependency towards self-direction (Gravett, 2000:65).

Adults need to be seen by others as independent and treated as being capable of self-direction (Knowles, 1990:20). Merriam (1998:7), referring to Knowles, views the andragogical learner as one who is autonomous, free and growth-oriented. Guffy (1998:426) points out that the learner should take responsibility for his learning. The

instructor merely facilitates the . The learner together with the facilitator must devise a plan, for meeting course objectives from the perspective of the needs of the respective learner. The instructor becomes a facilitator and is not merely a disseminator of knowledge (Caffarella, 1994:24).

According to Billington (2001: [online]) adults grow significantly in learning environments that they want to be in. Adults must engage in projects that reflect their interests. They need to be autonomous and self-directed (Lieb, 2001: [online]) in order to reach their goals.

5.5.3 Self-directed learning

Meredith (1989:1), referring to Knowles (1975), describes self-directed learning as "a process in which individuals take the initiative, with or without the help of others, to diagnose their learning needs, formulate learning goals, identify resources for learning, select and implement learning strategies, and evaluate learning outcomes". Knowles (1990:31) explains that the educator has to get the learner to engage in a process of mutual enquiry. The end result should be the transmitting of knowledge and the evaluation or conformity of acquired knowledge. The individual is engaged in collaborative, self-directed inquiry in self-actualising situations (Knowles, 1990:174; compare Ryan & Serdyukov, 2003, [online]).

Knowles (1990) supported the idea that learners become increasingly self-directed as they develop as learners. The learner must accept responsibility for his own learning (Merriam, 2001:5). In self-directed learning the learner controls both the learning objectives and the means of learning. Self-directed learning embraces the elements of lifelong learning (Meredith, 1998:1). When a learner decides what should be learned, who should learn, what methods and resources should be used, and how the success of the effort should be measured, then that learning is defined as self-directed learning. Self-directed learning is attempting to empower learners with new skills, knowledge and attitudes. These principles form the core elements of outcomes-based education and place the learner as central in the learning process (Meredith, 1998:2).

An important element is that not all adults prefer self-directed learning, as it requires independence, confidence and resources. In elearning learners are always assisted in the learning process through email or other technologies. The function of adult educators is "to assist adult learners in a way that enhances their capability to function as self-directed learners" (Mezirow, 1985:137). Instructional strategies can be applied

to ascertain the level of self-direc and then the instructor can provide the required support. The goals and processes to be involved for each learner to become self-directed are determined by educational level, creativity, learning style and readiness of the learner (Merriam, 2001:10).

Self-learning is an essential component of adult education. Research has shown that adults are very capable in acquiring skills, knowledge and self-insight when engaging in learning activities (Karp, 1996:1). According to Rutherford (1999: [online]) adults need to be self-directing and move away from authority-orientated, formal and competitive techniques and engage in collaborative learning environments.

5.5.4 Experiential learning

Adults have a reservoir of experience and rely on this previous learning to draw for their learning (Knowles et al., 1998: 64; Merriam & Caffarella, 1991:249). Adults have accumulated many experiences and adults in themselves become a rich source for learning (Gravett, 2000:65). Learners must connect learning that is relevant and influenced by previous experiences (Caffarella, 1994:24). Theories and concepts must be related to learners and recognise the value of experience in learning (Lieb (2001: [online]).

Adults change and develop continuously and adapt to new life and work experiences; they need to adapt to their circumstances. Educators must realise this and adapt their educational techniques accordingly. Thus, continuous learning forms the basis of adult learning (Rodgers, 1996:61).

As pointed out previously, adults also have vast amounts of experiences that they bring into the class. They can use their previous skills and knowledge to lead them to the understanding and acquisition of new knowledge and insight into such knowledge. Constant feedback is given to enrich the whole class (Rodgers, 1996:62; Rutherford, 1999: [online]).

5.5.5 Readiness to learn

Adults are motivated in order to perform tasks they need to know about in order to cope and handle real life situations in a real life context (Knowles et al., 1998:64)(Merriam & Caffarella, 1991:249). As a person matures, readiness to learn is focussed at his or her own development tasks and social roles to be performed (Gravett, 2000:65).

Adults engage in learning and they pursue (Caffarella, 1994:24). Classification and objectives of programmes must be clear and done early in programmes. This requires an outcomes-based approach to learning (Lieb, 2001: [online]). An important aspect for facilitators is to allow learners to engage in learning when they reach certain developmental levels. Learners will master learning content when they are ready to assimilate such information (Knowles, 1990:58).

5.5.6 Real-life applicability

An adult's working environment requires tasks to be performed. Adults learn to perform their tasks better in order to solve problems at work (Merriam & Caffarella, 1991:249). Different situations require different solutions and problems to be solved (Knowles, et al., 1998:64). Billington (2001: [online]) describes adult learners as autonomous. They want to design individual learning programs in order to function optimally in their profession. Adults' orientation towards learning becomes less subject-centred and increasingly problem-centred as it has a direct influence on quality of life. Adults (Gravett, 2000:65) pursue immediate responses and availability of information. Adults need to find immediate solutions to their problems (Caffarella, 1994:25).

According to Lieb (2001: [online]) adults must see a reason for learning something. Adults will choose subjects that are of interest to them. Adults prefer subjects that have a connection with or are related to work. Familiar settings contribute to a positive and learner friendly environment.

5.5.7 Motivation

Internal motivation is the strongest in adults. The strongest motivators are self-confidence and cultural influences (Merriam & Caffarella, 1991:249). External motivators play an important role but are secondary (Knowles et al., 1998:64). Adult learners are motivated by internal pressures (quality of life, job satisfaction and position) in order to cope with real-life situations (Gravett, 2000:65)

Developing countries focus on motivation in relation to the education of adults. Less consideration in industrial and professional development programmes (specifically in the West) has been given to the motivational aspect in educating adults. As educators we accept that adults should be motivated, ready to learn and have insight in their

studies. Mostly this is not the need to be guided, motivated and assisted in their learning (Rodgers, 1996:87).

Many adult programmes focus on the understanding of the 'self' and are learner-generated. Adults and their environment change continuously while the environment of children changes slowly; the setting children find themselves in is fairly stable. More should be done in adult education and learning to prepare adults in order to make their learning experience a creative, evaluative and self-fulfilling experience (Caffarella, 1994:24). However, levels of needs must be satisfied in full so that motivation can be encouraged in the reaching of self-actualisation. Howle (1961), in Rodgers (1996:90), sees motivation as "being related to goal-orientation or process-orientation or subject-orientation that compromises the inherent learning drives of the individual" (Rodgers, 1996:90).

Motivation of any person must be seen in relation to the person's specific situation. Herzberg (1972), in Rodgers (1996:91), explains that the setting (time, place and space) influences motivation that in turn has a direct effect on the internal drive to reach a particular goal.

Motivation in learning strongly depends on the learning situation as well as the learner. Educators must realise the vital role they play in extrinsic motivation. New kinds of drives should be used in order to support learners while learners should start accepting responsibility for their own learning, exercise more imagination and show more creativity and ingenuity (Rodgers, 1996:92)(Knowles et al., 1998:64). Lieb (2001: [online])(Merriam & Caffarella, 1991:85) provides six factors that serve as sources of motivation for adult learning.

- Social relationships: to make new friends and associates
- External expectations: to comply to authoritarian recommendations and expectations
- Social welfare: to improve ability to serve mankind
- Personal advancement: to achieve higher status and eliminate competition
- Escape/Stimulation: to relieve boredom and engage in new activities
- Cognitive interest: to satisfy an enquiring mind towards self-fulfilment

The motivation of adults to study may be restricted, as their many responsibilities must be balanced against the demands of learning. The best way to motivate adult learners

is to enhance their reasons for e onal programs and to minimise the barriers that prevent them in doing so (Lieb, 2001: [online]).

5.5.8 Transformational learning

One concept that can be used to summarize adult learning is 'transformational learning'. Transformational learning has at its theoretical base the transformation of the individual through learning. This process of transformation can occur suddenly and can be a powerful experience. The change within the individual to transform and change his/ her world is based not on information added to existing knowledge, but focus on changes on **"how we know"** instead of what we know (Baumgartner, 2001:15). Through empowerment and new knowledge learners can transform their world and environment (Baumgartner, 2001:15).

It is clear that adult learners should be empowered. Knowledge is available for the person who wants to find it. In this light, new experiences are characterised by interpretations and reinterpretations of what is discovered (Mezirow, 1991:170). Rational thought and reflection make up the recursive process referred to as perspective transformation. After experiencing a "dilemma" people engage in critical reflection and re-evaluate their circumstances. In doing so a realisation of inconsistency in the truth takes place. Transformation learning takes place as the learner changes or transforms his/her inconsistent schema that includes beliefs, values, habits and rules for interpreting experience and changes (perspective transformation). New perspectives are discussed with peers to obtain consensual validation. Once the learner achieves this stage, action needs to be taken for transformation and implementation (Mezirow, 2000:11). Social interaction is an important concept as the learner is an affective, emotional and social human being and learning seldom takes place in isolation.

According to Mezirow (2000:28) learners are continually developing. The transformational learning process is intuitive, holistic and contextually based. Learning has to take place in a safe, open and trusting environment. A move away from authoritarian action by the instructor is required. Learners must be more participative, collaborative, explorative and be allowed to be critical by giving regular feedback in situations where learning takes place. Facilitators of learners need to ensure that interrelationships between learners and learners, and between facilitators and learners exist. Learning must be seen as a mutual responsibility, to achieve the respective outcomes (Saavedra, 1995:124).

5.6 SUMMARY

This chapter focussed on andragogical assumptions that could form the basis to establish a framework to benchmark elearning at Technikon Free State. Adults are involved in elearning and higher education and it was therefore important to discuss the characteristics and uniqueness of adults as learners. Adults differ from children in their approach towards learning.

The overview of behaviourism, cognitivism and constructivism in the chapter pointed towards the unique elements in the learning processes are supportive towards the andragogical principles of learning. Elearning educators need to take note of the characteristics of adult learners. Adults are self-directed and the principles of self-directedness, experiential and transformational learning, learner-focused education, outcomes orientated learners, individualised learning and motivation for study need to be taken into consideration. These principles are incorporated in the proposed framework.

The following chapter discuss the research findings as found at Technikon Free State through qualitative and quantitative methods of research.

Central University of Technology, Free State

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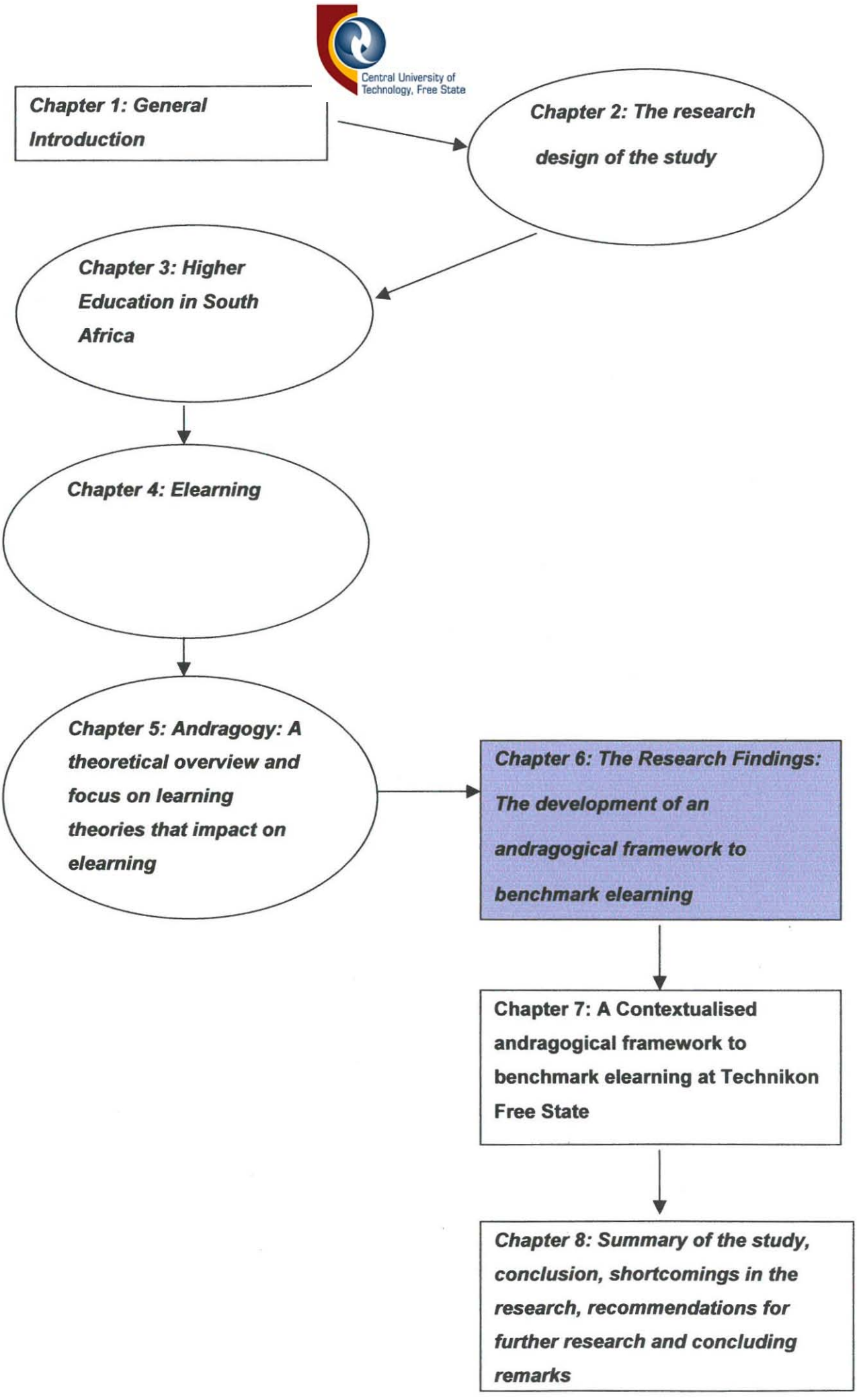
CHAPTER SIX



CHAPTER 6: THE RESEARC HE DEVELOPMENT OF AN ANDRAGOGICAL FRAMEWORK TO BENCHMARK E-LEARNING

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THE RESEARCH FINDINGS: THE DEVELOPMENT OF AN ANDRAGOGICAL FRAMEWORK TO BENCHMARK ELEARNING

6.1 INTRODUCTION

This chapter reports the findings of the case study. The phenomena namely elearning was investigated and the findings used in developing and implementing an andragogical framework to benchmark elearning at TFS.

The data that were used in this study came from questionnaires; interviews (with management, academic staff, support staff and learners), observations, written transcripts and the study of various documents of the institution were investigated. The data was transcribed and analysed by qualitative and quantitative methods as described in chapter two.

In the following paragraphs, the benchmarks for elearning will be discussed as part of the questionnaire that forms part of the investigation. The concept elearning and distance education is used interchangeably, but in all aspects of the research conducted refer to elearning. Further discussions, based on comments, observations, and interviews, as made by the researcher, will elucidate the concept *elearning*. In addition, information in documents (studied) that influence the development and the implementation of the proposed framework, will emerge.

Considerable dialogue throughout the research study with academia about what constitutes quality in elearning settings has generated further dialogues. This report is not intended to overcome many of the limitations of previous research. Instead, it uses a case study to help build a foundation for future analyses capable of refining or expanding upon the lessons learned from the institutions studied and through interviews conducted and observations made by the researcher. TFS and the researcher will attempt to validate those benchmarks that have been published by various academical institutions, with specific reference to elearning. This study is designed to ascertain the degree to which the benchmarks are actually incorporated *(presence*) in the policies, procedures, and practices of TFS as imbedded in its vision, mission and implementation of elearning. In addition, this case study seeks to determine how (*important)* the benchmarks are to management, faculties, academic staff and learners. The current level of *presence* of the respective benchmarks was

determined. A questionnaire was used as the main research instrument of this case study. In addition respondents were given the opportunity to voice any comments at the end of each section of the questionnaire. Similar comments are integrated throughout the text as well as observations made by the researcher and the information as transcribed in the interviews.

6.2. COMPLETION OF QUESTIONNAIRES

The following graph shows the response rate of the staff approached to complete the questionnaire to benchmark elearning at TFS.

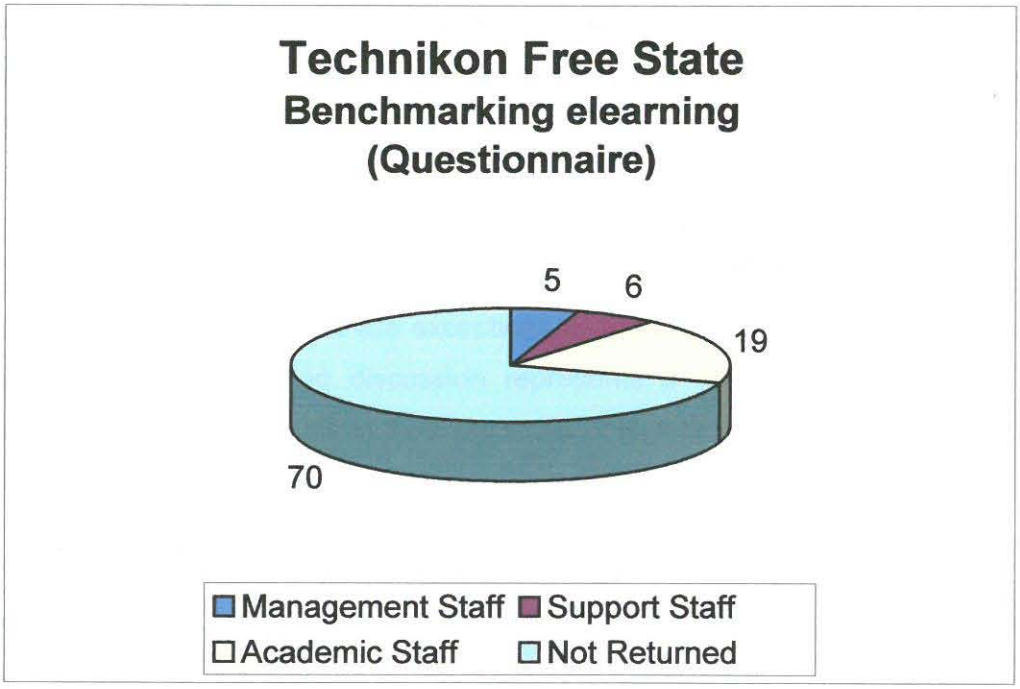

Chart 6.1: Response rate of TFS staff on questionnaires

6.3 HOW DID THE BENCHMARKS RATE?

It was clear from the site visits to TFS that quality benchmarks were considered with great care and chosen as based on andragogy, the new plan for higher education and elearning benchmarks from national and international institutions. At least one faculty member from management, as well as several learners (during interviews) stated that the benchmarks were on target and with some exceptions that will be explained later in this chapter need to be addressed to ensure quality in elearning courses and programs. As one respondent commented about the survey, **"The questions were**

good questions. Lecturers wo / of these items as very important and strongly agree, however one must consider inexperience, old traditions and new technologies as growing pains so one has to target the *most* important areas." TFS only recently embarked in elearning (2000). Another comment was that " **this questionnaire is completed with the Personnel Information Management (PIM) in mind."**

In addition, several respondents were somewhat annoyed that elearning was under such severe scrutiny, while the traditional classroom-based teaching was not under the same spotlight. One lecturer (who is actively engaged in elearning) showed his frustration by saying, **"The same standards and benchmarks we use in elearning should be applied to on-campus courses as well. Too many lecturers are hanging on to old values and traditions and do not want to embrace new technology."**

It should be noted that the intention of this case study is to validate the benchmarks for the higher education community in general; TFS can only benefit from the data as documented. While there are exceptions to the conclusions and comments from the interviews, the following discussion represents a consensus of a majority of the members that participated in the case study. It is, therefore, not appropriate to assume that the attributes outlined in the discussion always represent each and every response of the various individuals.

The information for this case study is both quantitative (the survey using a Likert Scale) and qualitative (the in-depth interviews, observations and the study of documents). No effort was made to apply any statistical tests to ascertain the degree of importance of a benchmark and its presence and the difference between the two. Instead, the interviews guided the analysis. The respondents were interviewed after completing the survey and many of their comments were directed to specific items in the survey. The interviews informed the quantitative data and served to elaborate on opportunities or information missed. The standard deviations of each benchmark are presented in Appendix Two to demonstrate more fully the range of consensus for each item.

This section is organized around the seven categories of benchmarks: Institutional Support, Course Development, Teaching/Learning Process, Course Structure, Learner Support, Faculty Support, and Evaluation and Assessment. A chart showing the relationship between the degree of presence for the benchmark, and its importance to the institution accompanies each category. The discussion of each category includes

comments from the interviews, a he questionnaire, observations and documentary evidence. It must be noted that many staff at TFS are poorly informed about elearning and its potential.

6.3.1 Analysis of Institutional Support Benchmarks

All of the benchmarks in this category were considered important to ensure quality elearning. With reference to (Chart 6.2) the benchmark addressing electronic security measures (#4) received exceptionally high ratings both with regard to importance and presence at the institution. On all accounts the researcher found TFS' security to be just and acceptable. There was a marked difference between the importance of the benchmark regarding a documented technology plan (#3) and the actual presence of a plan on campus. A Lecturer viewed benchmark (#1) by saying, **"I am not always sure of the existence of certain measures or incentives at TFS, as I am inexperienced in this field."** It was found that few documents did exist that can act as reference. Again, as a result of this new form of education many lecturers have no communicative channel to seek assistance. This was later rectified with the appointment of a helpdesk officer and a director for electronic education. Another comment was, "**Other institutions have at least a staff of more than 40, comprising of course material writers, instructional designers and assistants**. We as lecturers are expected to do everything." Trusts in partners in inter–institutional agreements are important for success (#7). It was considered as very important but was hardly present.

Respondents complained that because of the extraordinary growth of elearning they did not have trust in management support, as they themselves and management do not have knowledge about the design, development and implementation, but are expected as lecturers to be able to implement elearning.

Lecturers were also overburdened with other assignments that little time existed to develop elearning at their own institution. Needless to say, they did not even had enough time to complete their own design or development in elearning.

The following benchmarks for institutional support are displayed in Chart 6.2.

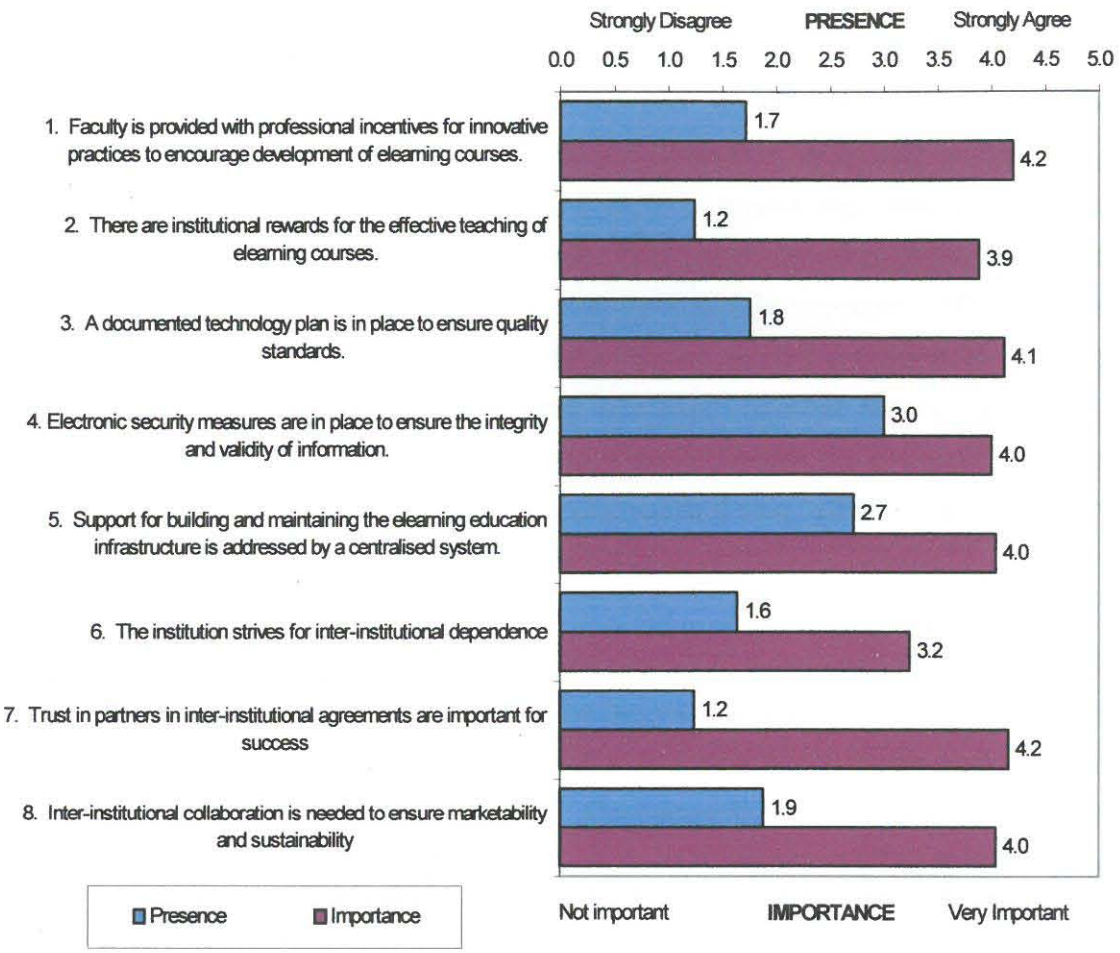

Chart 6.2: Institutional Support Benchmarks

It is clear that an enormous backlog exists in the 'support from management to fully implement elearning as well as experience from stakeholders.'

Respondents at some faculties complained that because of the extraordinary growth of elearning and the new changes in higher education, the infrastructure is constantly trying to keep pace with demand but are in most instances unsuccessful.

The case study revealed that compelling learner demand has other consequences with regard to planning due to increasing learner interest in elearning the Technikon introduced three year rolling plans. Management revealed that policies are being developed to catch up with practice. **"One member commented that the institution is moving ahead *without* all of the answers. This is of serious concern as it impedes on academic integrity."** Some faculties that are struggling to keep up with

the demand for elearning course onscious decision to serve learners immediately and plan later. **"It is not a wise decision as learners expect value for their money. We should be professional in what we do."**

Chart 6.2 reveals a substantial difference between the importance of the benchmarks concerning professional incentives and institutional rewards (#1 and #2) and its presence on campus. Whilst considered to be very important, rewarding and providing incentives to faculty for good online teaching did not receive high scores, also with regard to its presence at the various faculties. This conclusion was reinforced in the interviews, as revealed by the comments from one faculty member: **"The tenure, promotion, and reward system does not take into account the extra time a faculty member needs to teach well in elearning courses."** Another lecturer noted that, elearning, **"has to have of our better lecturers even though the rewards have not been there for them."** Another lecturer complained and said "**affirmative action has put us five years back."**

The dedication and knowledge of the faculty of engineering, who also teach elearning, was apparent in the structured interviews. The faculties who were interviewed showed keen insights into the teaching/learning process, and their peers considered many as some of the best educators at the institution. Consequently they had been exposed to elearning (elearning on satellite campuses) before and already applied technology to their presentation of learning material to learners. The high number of excellent faculty teaching elearning courses can be explained partially by the faculty selection practice. With few exceptions, faculty volunteered to teach elearning courses. Frequently this faculty comprised of veteran educators who were eager to teach using elearning. This selection process, of course, produces an array of courses that may not necessarily represent a strategic plan of course and programmatic offerings. This is not to suggest, however, that elearning courses are generated without planning or strategy. As one lecturer put it, **"although this institution did not have a strategic plan, 'strategic thinking' was used in the development of elearning courses and programs within the faculty."**

It was found that a faculty that offers programmes that are required by business and commerce, with many adult learners (studying away from campus: elearning learners) were compelled to develop elearning material sooner, than those faculties with their learners studying on campus. For instance, several faculties attempted to develop elearning offerings for courses that had high enrolments such as lower division, general education courses. An important feature is the constant changes that are forced upon

the centre for elearning to chan /e satellite campuses and organize and equip many facilities with little support. **"Too many changes are taking place. As educators we can adapt to change, but if it happens too often we are unhappy and become demotivated."**

6.3.2 Analysis of Course Development Benchmarks

The three benchmarks relating to learning styles received a mixed reaction from the respondents. As shown in Chart 6.3, benchmarks (12 and 13) were not considered very important and did not have a high degree of presence at the faculties. Benchmark (#13) received low scores with respect to both importance and presence. The interviews helped to explain these sentiments. **"Many faculty and administrators stated that while learning style benchmarks sound good on paper, actually meeting the standard is very difficult."** One faculty member suggested that the research on learning styles is very poor and simply may not be an appropriate criterion for benchmarks. I felt as researcher, on the other hand, that many lecturers are so fixed in their views and ways (being traditionalists) that they experience change as threatening and/or simply are not interested. However, of crucial importance change is needed to be in line with global trends. Not adapting in an open educational market is contributing to one's own downfall.

The benchmark addressing the management of course design (#11), also received mixed reactions. By and large, the development of a course was the responsibility of individual academic departments and the extent to which the procedure met the criteria in the benchmark was a departmental decision. One faculty member said, **"Some of the items suggest that greater evaluation, oversight, and course development ought to take place in elearning than for traditionally delivered courses. Of importance is that one must just plan more carefully, and in advance. Another lecturer commended " it is going to force all educationists, to get involved."**

Traditional courses rarely come under that kind of scrutiny on campus as it is limited to only certain learners, whilst elearning is exposed to anyone who have enrolled or have access to the Internet.

The provision of guidelines (#10) was seen as the most important and indeed present. The researcher found that lecturing staff was eager to develop, design and deliver elearning in their respective fields, but they feared scrutiny from colleagues and were unwilling to participate. Lack of the practical skills to engage in elearning, (as well as

the lack in the application of varic also probe lecturers, to abstain. The lack of written guiding principles in elearning made lecturers negative towards this type of education. Many knew the end goals (outcomes) but lacked the knowledge and experience of which road to follow. Lack of in-service training also confirmed this sentiment brought about this feeling. One negative lecturer added,**"If we don't do what our respective heads of departments want, papers will be pushed around."**

It is important to note that a possible disparity may exist between the technology that an institution might possess and the technology available to the typical learner or lecturer. A lecturer explained, " I cannot work at home as I do not possess a computer. It is therefore not always possible to be fully committed to additional work, as I am barely coping with current learner numbers". Another concern is that although facilities exist and are made available to lecturers and learners, they do not always utilize the facility or the facility is not accessible at certain times. Faculties may have enhanced, or are enhancing, their capability with high-speed networks with additional bandwidth, and improved video quality, but course development must still take into consideration the technology that the learners and lecturers possess. Many learners have older personal computers, equipped with slow modems, insufficient memory, and small hard drives. The disparity between the technological capabilities of the institution and its learners was referred to as **"cutting edge, not bleeding edge"** by one interviewee, while another referred to the **"trailing edge"** of technology. Learners are not familiar with the use of computers and lack basic computer skills. **"Some learners barely passed their national senior certificates and are not fit to enrol on our level. Just look at the high dropout rate of our first year learners."** The following chart will reveal the benchmarks for course development (Chart 6.3).

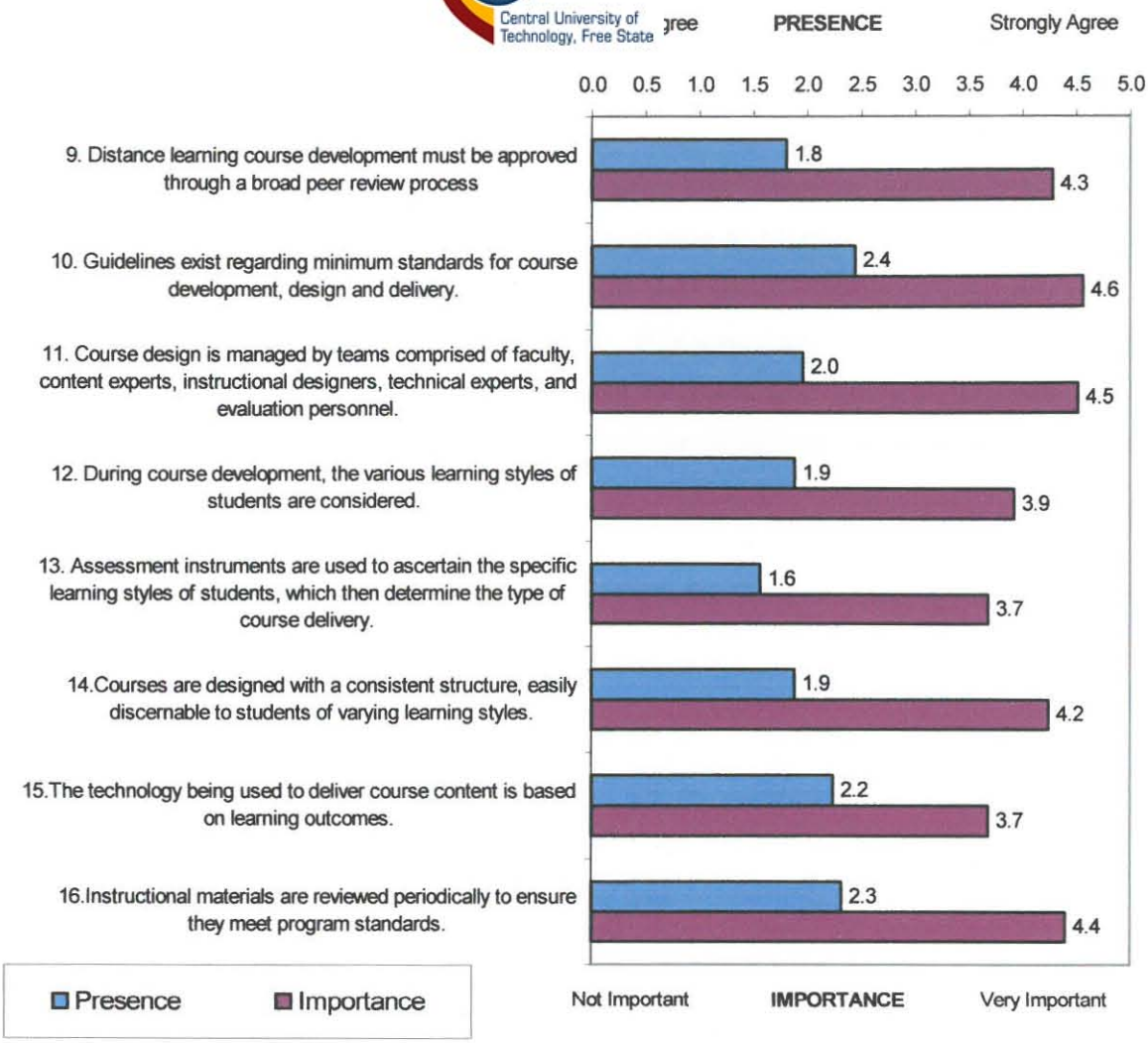

Chart 6.3: Course Development Benchmarks

The lines between traditional classroom education and elearning education are becoming blurred. The disparity between the technological capabilities of the institution and its learners was referred to as "cutting edge, not bleeding edge" by one interviewee, while another referred to the "trailing edge" of technology.

6.3.3 Analysis of Teaching/Learning Process Benchmarks

The majority of the benchmarks regarding the teaching/learning process were considered both important and present on the campus. However, as shown in Chart 6.4, the benchmarks related to collaboration and modular learning was not endorsed widely. Benchmarks 17 and 22 were not seen to be very important and, likewise, did not display as high of a degree of presence at the faculties as other benchmarks in this category. Several comments may help to explain this. In general, faculty and

administrators suggested that c n end in itself was not necessary. Collaboration depends upon factors such as the content of the course, the level of instruction (undergraduate versus graduate), and the values of the instructor. Regardless of its importance, however, one faculty member noted, **"Elearning learners are collaborating much more than learners in traditional classes."**

Modular learning was seen as very important. It is important to note the interactivity between benchmarks in this section. Of concern is that all the respondents viewed this section as the most important, but in all the benchmarks scored low on being present at TFS.

Teaching/learning benchmarks form the basis for sound educational practice and ensure a system that is quality driven.

Chart 6.4 shows three benchmarks that address the process of interactivity (#18, #19, and #25), all of which received high scores for importance and presence. It has become increasingly evident that interactivity is the cornerstone for quality in elearning. Indeed, many would say that it is crucial for *any* type of learning.

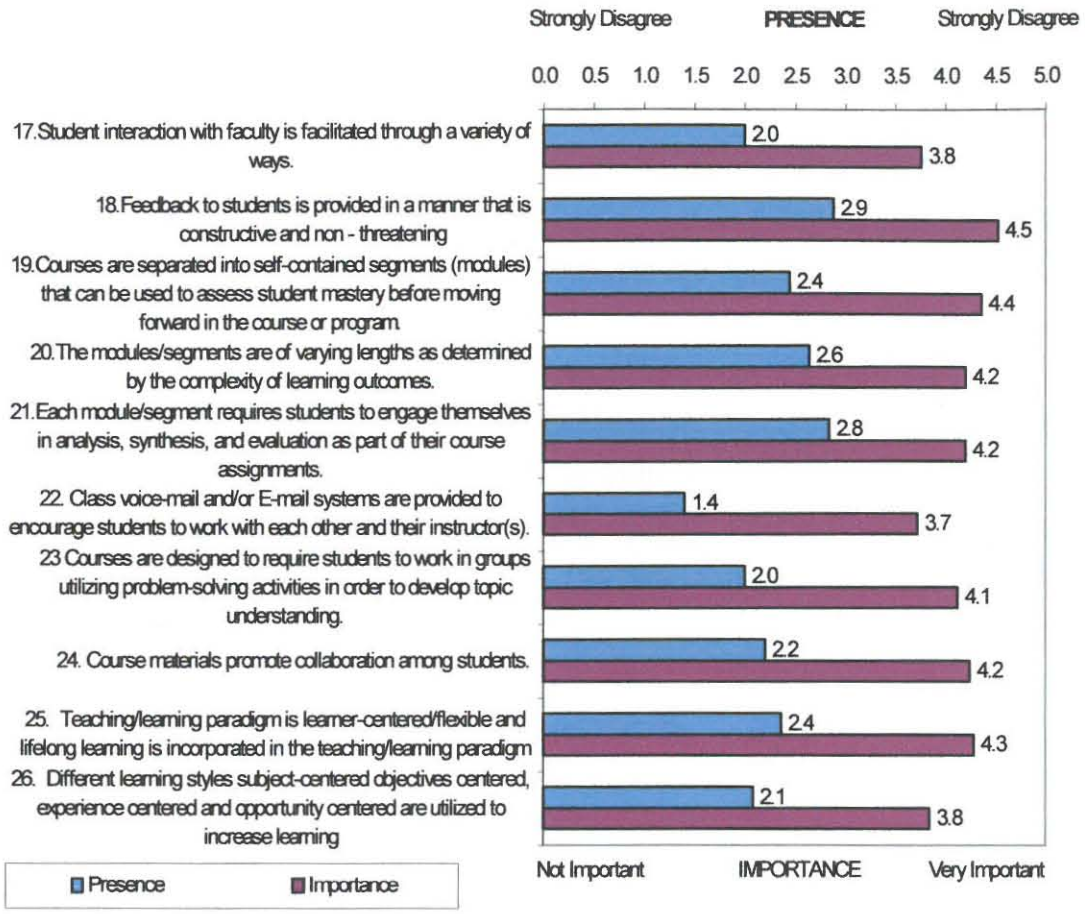

Chart 6.4: Teaching/Learning Process Benchmarks

Elearning courses require more discipline, but you can work at your own pace, place and time.

If, in addition, we understand academic studies as a process in which the aim is education through *knowledge*, we cannot do without a considerable proportion of dialogical learning and teaching in elearning. (Peters, 1999:39) Many respondents agreed. One faculty member wrote: **"Learners need to communicate almost on a daily basis, not just once a week." Another noted that "in order to facilitate interactivity, in addition to e-mail and voicemail, a conference system is very important."** One learner reflected the observations of several others in stating, **"The majority of online classes I have taken have been set up very well for a successful educational experience."** The instructors for these classes encouraged communication between their learners and themselves and were available to answer questions at any time through e-mail. One lecturer noted that," **the delivering system Web CT is very complicated and a more user friendly system is needed."** They

also provided timely and valuable gnments, which is very important for a learner's academic success." The notion of interactivity is highlighted here, not only because it is central to the quality of elearning, but also because it leads to the realization that electronic elearning is evolving its *own* pedagogy (The researcher prefer andragogy, compare chapter five). As noted by many respondents at TFS and others, elearning courses have certain characteristics that are unique to the technology-which allows the exploration of new educational models like *andragogy.* Faculty are still learning about, and experimenting with, different ways in which learners can interact with faculty, with other learners, and with a wide variety of instructional resources. One institution combines the use of asychronous technologies to facilitate much of the classroom interactions and synchronous communication to facilitate small group interactions and course office hours. With respect to interactivity, one faculty member lamented that: **"Too often we try to emulate the classroom. Even software vendors try to emulate the classroom. The fact is that elearning is affecting how we teach in traditional classrooms."**

6.3.4 Analysis of Course Structure Benchmarks

In general, the course structure benchmarks were seen as important but not as present at the faculties. With reference to chart 6.5 the researcher found benchmark (#30 and 31) to be well represented. TFS's library is well organized and equipped as the staff is well trained to deliver a supportive and efficient service to lecturers and learners alike. Benchmarks (#33, #34, and #35) are seen as very important. For any learning, and especially elearning to be fully functional a much higher expectancy rate is needed. Although learners are screened before course enrolment, benchmark (#32) shows that motivation is not of such importance. It was observed and noted that the highest dropout rate was with first year learners. The researcher proposes a better and stricter selection process for first years, as well as a learner program for motivational support. Chart 6.5 shows the course structure benchmarks.

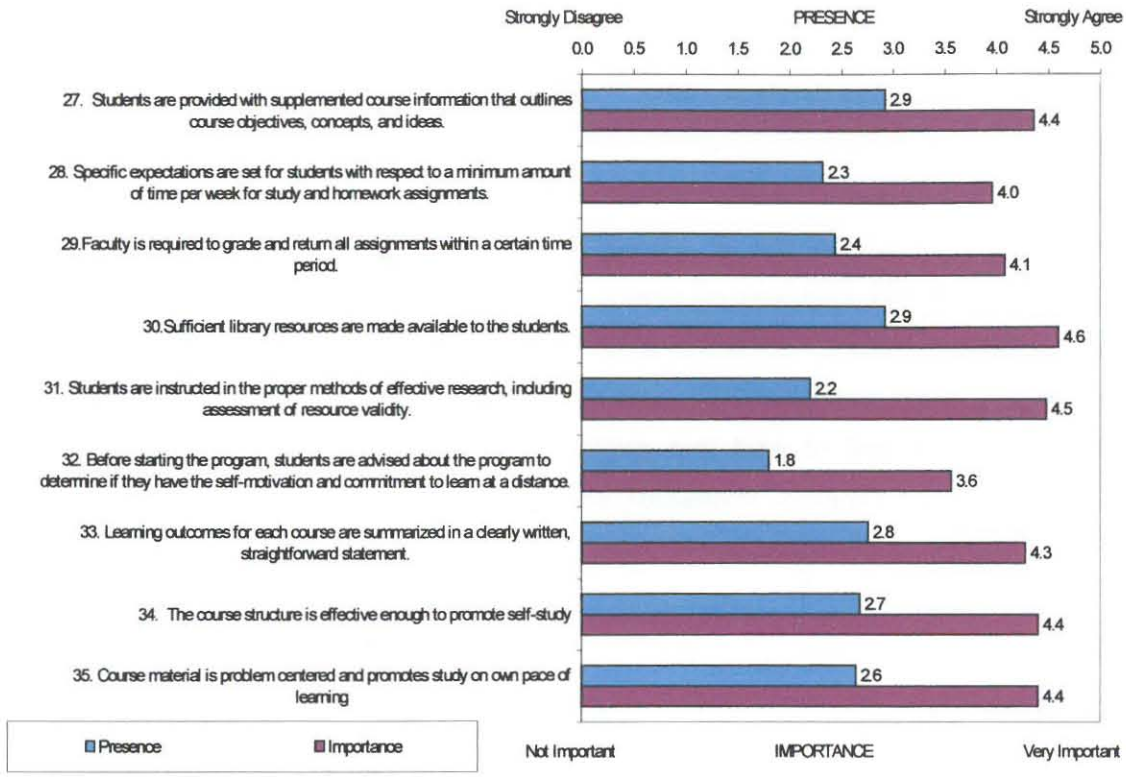

Chart 6.5: Course Structure Benchmarks

Self-directed study, which is prevalent at the tertiary level, is being pushed down to the undergraduate level because of elearning and its benefits without the necessary support and expertise.

However, as illustrated in Chart 6.5, benchmarks (#27 and #28) addressing specific time requirements were the exception, scoring lower in terms of presence. Many respondents balked at the prescriptive nature of these benchmarks. Given the dynamic and innovative characteristics of elearning, particularly the capacity for learners to pace them in a variety of ways, hard and fast rules on how much work should be accomplished in a specific time period or the precise response time for a faculty member is inappropriate. One learner responded to a minimum amount of time per week for study: **"The faculty can give us recommendations and the necessary guidance, but they don't 'push' you. I enrolled in an elearning course so I would have the freedom to study at my pace and when I wanted to study. I did everything at my own pace for the first course."** However, there was strong consensus that faculty and learners must agree when assignments need to be completed and returned. The very high ratings for the benchmark regarding library resources (#30) are worth noting.

TFS has also made computer and Internet facilities available for its learners. In many respects, the library has become the learner's home or workplace. Support staff assists learners. Several learners reported that, **" Our library is very well equipped and we can use computers and the Internet to help us with assignments and our studies."** The library resources include many online full-text books and, if needed, interlibrary loans. Reference assistance to learners is not neglected and some respondents suggested that a reference person should be available. The library at TFS is open till late and on Saturdays to accommodate requests. It also has an online request facility to accommodate elearning learners. TFS also has made programs available for training learners in the library ethics and how to find resources and conduct research. A research tutorial and guide (Research Toolbox) is also available (in the library/lending CD-ROM).

It may be helpful to examine briefly the issue of class size, although there are no benchmarks directly related to maximum class size. Although the case study revealed a wide variety of opinions, it is inappropriate that a specific benchmark on maximum class size be introduced. More than one respondent suggested that there should be a maximum size, say 20 or 25 learners. Another recommended that the first elearning a faculty member teaches should enrol no more than 15 learners. Class sizes and the incrementally increasing learner enrolment in elearning courses are an important factor to consider as it has a direct impact on planning, appointment of staff and the financial planning of the institution. The researcher observed that appropriate interaction and successful learner outcomes could be achieved in courses with large learner numbers, provided that learners get sufficient support and that lecturing staff can cope with the demand. The design of courses in this regard should be on par with benchmarks as contained in this document. Enrolments using a variety of methods, including learner collaboration were found to be successful in elearning (Faculty of engineering). It could be argued that maximum class size relates more to faculty course workload than learner outcomes. It appears, therefore, that a specific benchmark for class size is ill-advised, and much more experimentation needs to be conducted.

6.3.5 Analysis of Learner Support Benchmarks

Each of the benchmarks in this category was ranked as having a high degree of importance. However, it appears that, for all the benchmarks (#36, 37, 38,39,and 40), the respondents felt they have some way to go. It is important to understand that traditional on-campus learners are among those participating in elearning by taking one or two courses, because it is convenient or to avoid conflicts with another course.

Therefore, learner support ser a broader audience than would otherwise be expected. Furthermore, it was noted that those learners who are at a distance and do not come to the campus might have greater need for feedback than the traditional on-campus learner. As one learner noted, "It is of the utmost importance to be helped immediately." To address this problem, TFS has established an electronic peer network in a web-based environment that enables learners to interact academically and socially online. Learners are able to identify other learners with common interests, participate in live chats and threaded discussion groups, exchange books and study materials, locate study partners, access career resources, and/or join an online study group.

TFS has also issued all learners at its campus with an e-mail address whether the learner is enrolled for an elearning course or not. This move in itself allows learners to receive all their correspondence through e-mail and paved the way for a dual mode (blended) way of education (compare chapter eight). Many respondents recognized that a number of learners need more preparation for working on the elearning. As a consequence, faculties provide technical assistance through a variety of ways, including e-mail, a real-time chat room, and an online tutorial for technical assistance. Technical staff meets several times a year to improve the technical support, based on learner complaints (Badenhorst, 2002: [interview]). In areas other than technical assistance, learner support personnel are devising several ways to help online learners. All stakeholders at TFS are involved to improve learner support, as well as the improvement of elearning facilities and the exposure thereof.

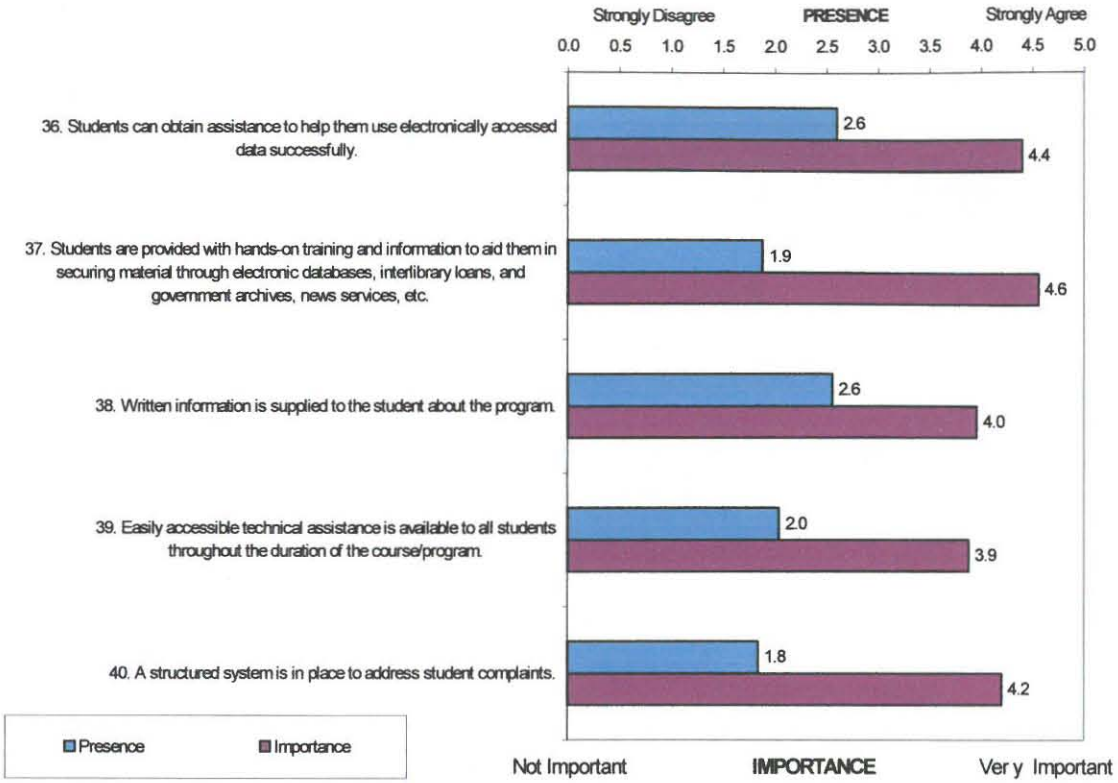

Chart 6.6: Learner Support Benchmarks

Learners need to understand more fully the role and responsibility they need to take in participating in elearning courses.

6.3.6 Analysis of Faculty Support Benchmarks

All the benchmarks in this section (#41,42,43,44, and 45) were considered to be very important by the respondents (refer to Chart 6.6 and 6.7). The benchmark (#41) showed a significant presence level. This was due to the fact that lecturing staff had to comply to engage in elearning as required by management's policies and the demand placed upon them by learners. Several courses in using Web CT™ were also provided to lecturing staff to assist them in the design and delivery of their respective courses. The Centre for Elearning was also prominent in assisting and supporting staff with the necessary knowledge and skills to develop courses and course materials.

The benchmarks that had to do with peer monitoring support (#42) showed a low level of presence. The following Chart 6.7 shows the various data as recorded through the questionnaire.

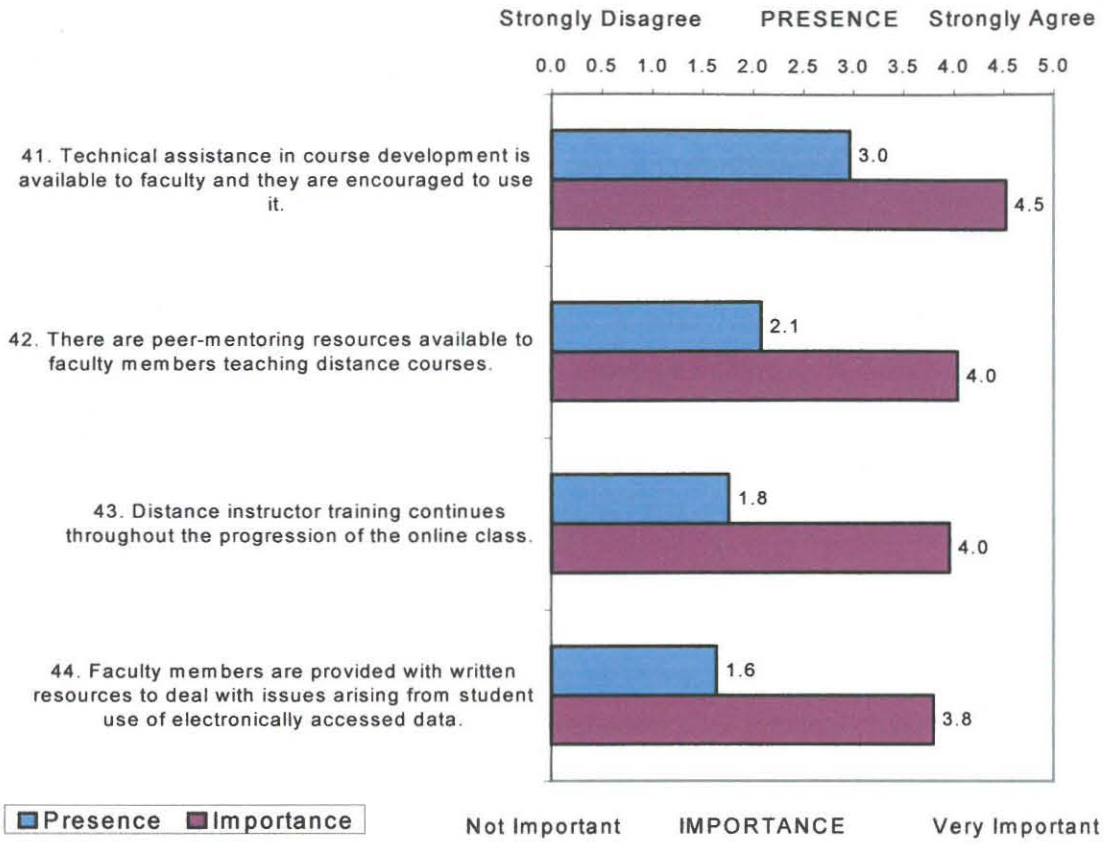

Chart 6.7: Faculty Support Benchmarks

It is clear that much more needs to be done by management, faculty and all other stakeholders to ensure that learners are supported and able to complete their respective courses.

As can be seen, a transitional process is in motion at TFS, since there is a discrepancy of what is needed and what is currently present. As outsider and researcher it was evident that many lecturers are not yet ready to engage in elearning and are still bound by the traditional approach of being teacher-focussed as opposed to being learner-centred. As researcher it was clear that many respondents could see what the future was about, but **resisted to change as a result of being without the skills to change to** electronic course format or their inability (making a charge at their competency). Criticism from learners and or management was a concern.

One learner responded: " The e been better planned and designed. I am much more computer literate and able than the course leader."

As researcher it was clear to me that much more technical support must be given to lecturers in assisting them in designing their courses in electronic format. TFS has currently (2003) only two staff members as part of their elearning initiative. In comparison the University of Pretoria has a staff of 73 that comprises of developers, instructional designers, administrative staff and managers to plan the educational process and courses (Fresen, 2003: [online]). Another learner replied **" Sometimes I felt alone as the electronic courses were more like correspondence courses and lacked feedback from the lecturers."**

Learning covers virtually all of a particular learner's needs, including financial aid, academic program, tuition and fees. Lecturers are in totality responsible for the well being of their learners. **"Lecturers are supposed to be able to fully support learners in all areas."** This is not possible as many still lack skills in especially using elearning software. As one lecturer complained and stated, **"I have almost 500 learners to look after. I can barely cope with the current on campus demand. It is an impossibility to take on any more responsibility."**

Through observation the researcher found this to be true as there is a lack in support and encouragement for elearning learners as a result of insufficient staff. These issues led several respondents to suggest that a new benchmark needs to be included under learner support: **"Questions directed to learner service personnel must be answered accurately and quickly."**

All the benchmarks addressing support from faculty were seen as very important. However, all the benchmarks had low scores for presence. Institutions visited and studied have systematic processes for transitioning faculty to elearning instruction from the traditional classroom and for training and assisting faculty teaching online courses. Given that a substantial number of faculty staff teaching elearning courses volunteered freely to participate in interviews and answering the questionnaire. Many are veteran lecturers respected by their peers, their standards are quite high and their dedication is keen. Information from the interviews strongly suggested that a major reason for the less than optimum presence of assistance was lack of resources, not lack of will. As noted earlier, lecturers are trying to keep up with learner demand, while sufficient personnel and financial resources may be lagging behind. This is particularly true in the

area of technical assistance. Ma ewed, lamented that the "**technical aspects of elearning is sometimes overwhelming**."

6.3.7 Analysis of Evaluation and Assessment Benchmarks

All of the benchmarks in this category are considered important by the faculties in the case study. Benchmark (#48) addressing successive use of technology, however, had a relatively low mark for presence. By and large, all of the faculties had systems in place that addressed evaluation and assessment. All faculties had elaborate evaluation and assessment procedures, but not as expected for elearning, outcomes–based or continuous assessment. It is clear that all of the faculties recognize the importance of evaluation and assessment. Of importance is that a gap still exists in all these benchmarks insofar as presence is needed.

Figuring out what works is an exciting challenge in education, but magnified by elearning. It's an exciting time to be an educator. In elearning, data are used to calculate a program's "health" rating in six areas: learner demand; learner retention; learner satisfaction; faculty satisfaction; learner achievement and financial efficiency.

Concern regarding the apparent high attrition of elearning learners as compared to traditional learners was highlighted. One lecturer mentioned that there seems to be an inordinately high number of the following grades: (distinction)(**A**), fail (**F**), and/or (withdraw)(**W**), for elearning learners. Respondents from other faculties in the case study also referred to this problem. This evidence suggests that there may be a **bipolar distribution** where learners are either quite successful or dropping out. This further supports the conclusion in that learner attrition in elearning is an important research topic in the evaluation and assessment programs of faculties. Of importance is proper learner support. Chart 6.8 contains the responses from respondents on evaluation and assessment benchmarks.

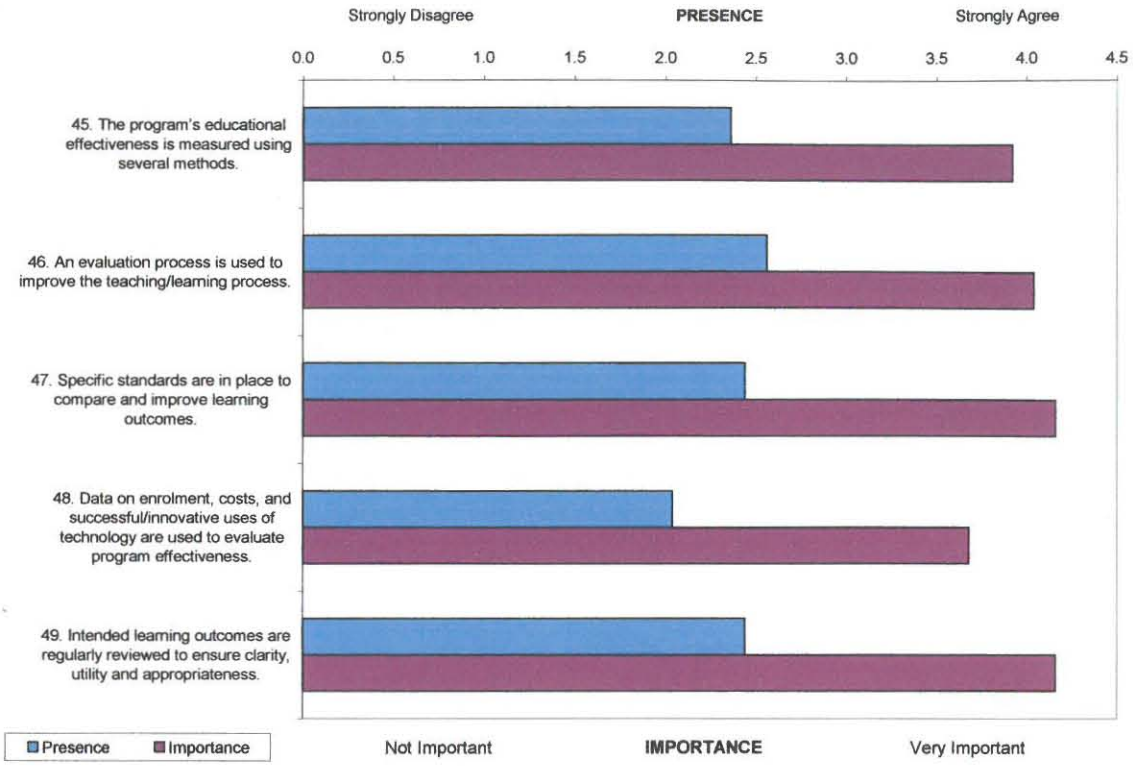

Chart 6.8: Evaluation and Assessment Benchmarks

It is clear that a uniformal system be in place, to address all forms of evaluation and assessment and it needs to be on a continuous basis.

6.4 SUMMARY

In this chapter the questionnaire was discussed. The different aspects of the benchmarks as required were taken into consideration. These benchmarks are seen to be nationally and internationally acceptable. The researcher however, added other benchmarks that incorporated andragogy and aspects of the requirements for Outcomes-based education by the South African government.

In addition, all other relevant data were discussed. Data discussed included interviews as conducted with management-, support- academic staff and learners. Other inscriptions and comments followed on the study of documents at TFS and observations made throughout the three-year period at TFS. The researcher also added his own ideas as a conglomeration of the many facades discovered in elearning and from his own experiences.

The next chapter contains the proposed framework to benchmark elearning at TFS. The proposed framework is based on andragogy (refer to chapter five), the new plan for higher education (refer to chapter three), and elements needed to ensure proper analysis, design, development, implementation and delivery of elearning courses (refer to chapter four).

Central University of Technology, Free State

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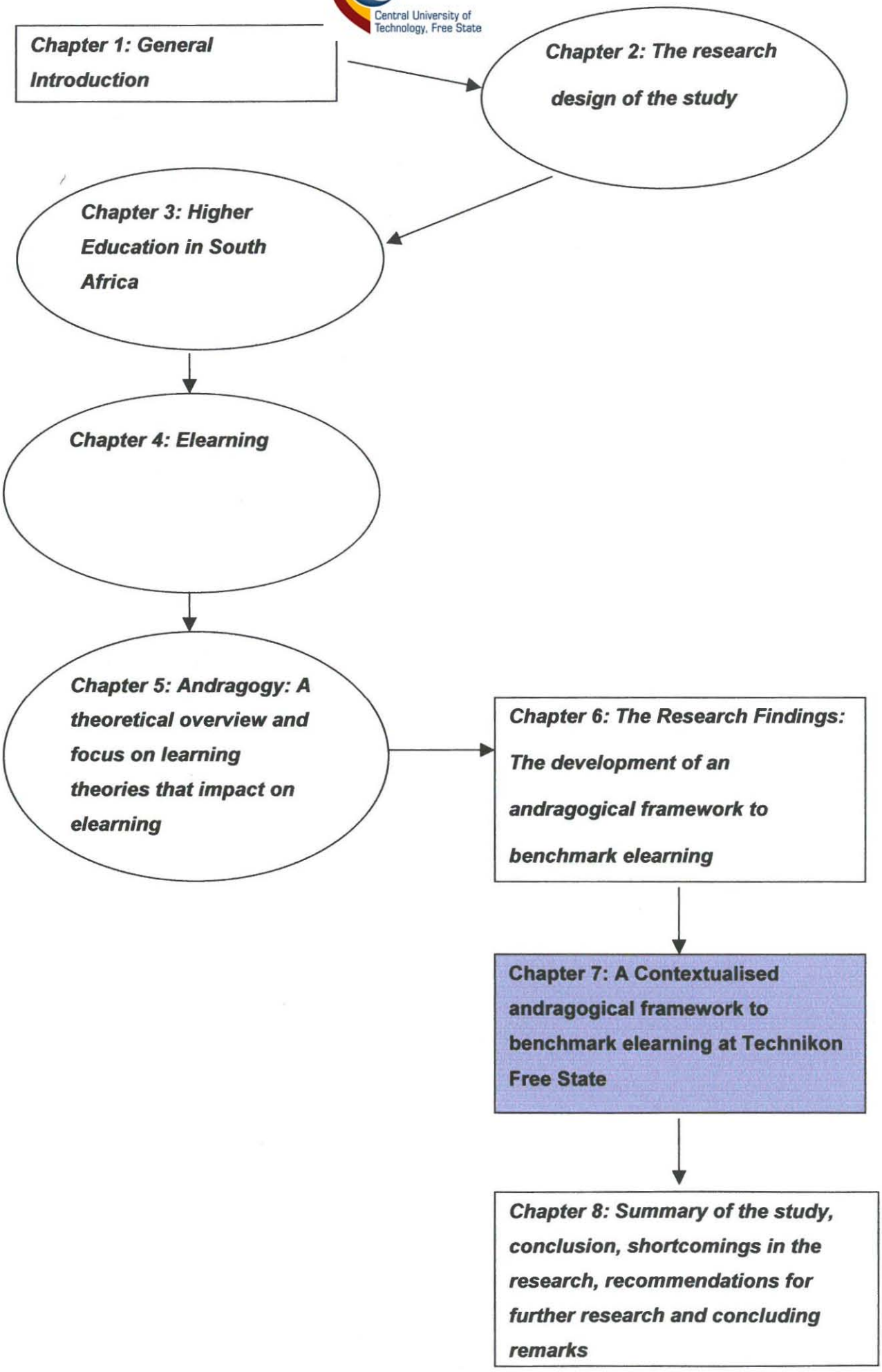
CHAPTER SEVEN



CHAPTER 7: A CONTEXTU/ \GOGICAL FRAMEWORK TO BENCHMARK ELEARNING AT TECHNIKON FREE STATE

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7.1 INTRODUCTION

The aim of this chapter is to present the proposed andragogical framework for benchmarking elearning at TFS. The framework is based on the principles and characteristics of Andragogy, Elearning benchmarks and the Plan for Higher Education, as adapted in 1996.

7.2 THE PRELIMINARY FRAMEWORK

A framework is a structural basis or plan of an organisation. A framework can therefore serve as the starting point for exploring the implementation of elearning. In this case, the preliminary framework is derived from literature only. Once a field study is undertaken, the framework may have to be adapted for the contextualised TFS needs. Although the preliminary framework can be used to benchmark the implementation of elearning at TFS (on a macro-level), the contextualised factors need to be accommodated in a recommended framework, which in turn can be used to benchmark elearning at TFS. As the study was done in a contextualised setting as part of a case study, the framework will aid lecturers to implement elearning at TFS.

The preliminary framework is derived from the literature study that was undertaken in chapter three, four and five. In the first place, the elements of the framework are derived from essential elements, features, principles and dimensions of the National Policy for Higher Education (chapter three). The framework is further supported by current knowledge of elearning theory (chapter four). Lastly, the framework is embedded in andragogical foundations (chapter five). Therefore, the framework is a representation of the factors that need to be considered when elearning is implemented and benchmarked in the context of this inquiry. The next sections of this chapter are used to extract core principles from andragogy, the new plan for higher education and elearning. These principles will be codified, integrated and tabled. All the principles are integrated in a comparative table to benchmark elearning. These principles will then form the elements used to benchmark and supply the proposed framework for elearning at TFS.

7.2.1 Andragogy

The assumptions and criteria that underpin an andragogical approach to elearning are tabulated in table 7.1. These assumptions and criteria were derived after an extensive review of literature was undertaken (see Chapter 5).

Code	Assumptions about andragogy	Criterion
AN1	Focus on developing the self concept	Moves from dependency towards self-direction
AN2	Accumulating experience. Role of learner's experience	As a person matures he/she becomes a rich resource for learning and of knowledge. Rich resource for learning by self and others
AN3	Readiness to learn	Oriented towards task development and social roles.
AN4	Orientation towards learning	Less subject centred and more problem centred
AN5	Goals of education	Must be clear to initiate learning
AN6	Motivation of the learner	Internal pressures. By internal incentives
AN7	Concept of learner	Increasingly self-directed
AN8	Readiness to learn	Develops from life tasks and problems
AN9	Orientation to learning	Task - or problem centred
AN10	Climate	Relaxed, trusting, mutually respectful, informal, warm, collaborative, and supportive
AN11	Planning	By facilitator and learners mutually
AN12	Diagnosis of needs	By mutual agreement
AN13	Setting of objectives	By mutual negotiation
AN14	Designing learning plans	Learning contracts, projects and sequence of readiness
AN15	Learning activities	Inquiry projects, independent study and experiential techniques
	Adult learner-centred approach	
	Constructivism (compare 5.3.2)	
	Collaborative, supportive learning	

Code	Assumptions about andr	rion
	Adults directed towards learning at own pace and place	
AN16	Assessment	By learner – collected evidence validated by peers, facilitators, experts and according to expected criteria

Table: 7.1 Andragogical principles in elearning (Adapted from Knowles, 1980:43)

From these assumptions and criteria, principles can be generated that will aid the implementers of elearning in creating sound policies for such implementations. These principles will have to be integrated with other aspects, specifically those which were identified for the purposes of this study. Together, the integrated principles will form the basis of a framework for implementing elearning.

7.2.2 Imperatives of the South African Higher Education Policy

The changes in higher education have forced educators to rethink their teaching strategies in order to stay in touch with the latest technological developments. The Education White Paper: A Programme for the Transformation of Higher Education, as well as the Higher Education Act, 1997 (Act 101 of 1997), provide the policy and legislative framework necessary for the transformation of the higher education system. These documents also outline the role and functions of all those concerned with higher education in South Africa (South African Yearbook, 2000/01:10). The framework for benchmarking elearning is guided by the policy and legislative framework, as contained in the Act and related documents (See chapter 3).

Table 7.2 contains principles required by higher education that can be used to establish a framework to benchmark elearning.

Code	Requirement	Criterion
HE 1	SAQA Act (4 October 1996)	Development and implementation of National Qualifications Framework
HE2	National Qualifications Framework (NQF)	Single infrastructure to catalogue unit standards and qualifications

Code	Requirement	Criterion
HE3	Outcomes Based Education	Critical thinking, reasoning Learners are active and involved in the learning process Communication is critical Learning is outcome and process driven and connected to real-life situations Learner and outcomes centred Teacher is a facilitator of learning Learning programmes are seen as guides Emphasis is placed on outcomes – what the learner achieves Wider stakeholder involvement is encouraged
HE4	Open learning	Accessibility to learners
HE5	Flexible learning	Study at any time, place and determine own pace of progress
HE6	Recognition of Prior Learning (RPL)	Previously disadvantaged learners can enrol at institutions and have their experiences gained, assessed for academic recognition
HE7	Unit Standards	Learners can acquire credits in various fields of learning towards a qualification in completing smaller outcomes
HE8	SAQA Registration	All qualifications obtained are nationally and internationally accredited if registered with SAQA
HE9	NQF Framework	The framework provides an integrated educational system to accommodate all learners by removing previous barriers
HE10	Facilitation of learning	Educators are changing their role from teacher to facilitator of learning
HE11	Adult Basic Education and Training	Adults are also incorporated in the new plan for higher education

Table 7.2 Higher education benchmarks (compare chapter three)

From the assumptions and criteria, principles can be generated that will aid the implementers of elearning in creating sound contextualised policies for the South African situation. These principles will have to be integrated with other aspects, those which were identified for the purposes of this study (an andragogical approach and elearning pedagogy). Together, the integrated principles will form the basis of a framework for implementing elearning.

7.2.3 Elearning Pedagogy

Table 7.3 provides essential principles for elearning implementation against a pedagogical frame of reference (the term 'pedagogy' here is used in its broadest sense, and refers to aspects of sound teaching practices within electronic learning environments). These assumptions and criteria were derived after an extensive review of literature was undertaken (see Chapter 4).

Code	Criterion
	Institutional Support Criterion
EL1	Faculty is provided with professional incentives for innovative practices to encourage development of elearning courses
EL2	Institutional rewards for the effective teaching of elearning courses
EL3	A documented technology plan is in place to ensure quality standards
EL4	Electronic security measures are in place to ensure the integrity and validity of information
EL5	Support for building and maintaining the elearning infrastructure is addressed by a centralized system
EL6	Inter-institutional dependence is strived for by the institution
EL7	Trust in partners in inter-institutional agreements are important for success
EL8	Inter-institutional collaboration is needed to ensure marketability and sustainability
	Course Development Criterion
EL9	Elearning course development must be approved through a broad peer review process
EL10	Guidelines exist regarding minimum standards for course development, design and delivery
EL11	Teams comprised of faculty, content experts, instructional designers, technical experts, and evaluation personnel manage course design

	Course Development Criterion
EL12	During course development, the various learning styles of students are considered
EL13	Assessment instruments are used to ascertain the specific learning styles of students, which then determine the type of course delivery
EL14	Courses are designed with a consistent structure, easily discernable to students of varying learning styles
EL15	The technology being used to deliver course content is based on learning outcomes
EL16	Instructional materials are reviewed periodically to ensure they meet program standards
EL17	Student interaction with faculty is facilitated through a variety of ways
EL18	Feedback to students is provided in a manner that is constructive and non-threatening
EL19	Courses are separated into self-contained segments (modules) that can be used to assess student mastery before moving forward in the course or program
EL20	The modules/segments are of varying lengths as determined by the complexity of learning outcomes
EL21	Each module/segment requires students to engage themselves in analysis, synthesis, and evaluation as part of their course assignments
EL22	Class voice-mail and/or E-mail systems are provided to encourage students to work with each other and their instructor(s)
EL23	Courses are designed to require students to work in groups utilizing problem-solving activities in order to develop topic understanding
EL24	Course materials promote collaboration among students
EL25	Teaching/learning paradigm is learner-centered/flexible and lifelong learning is incorporated in the teaching/learning paradigm
EL26	Different learning styles, subject-centered objectives centered, experience centered and opportunity centered are utilized to increase learning
	Course structure Criterion
EL27	Students are provided with supplemental course information that outlines course objectives, concepts, and ideas
EL28	Specific expectations are set for students with respect to a minimum amount of time per week for study and homework assignments
EL29	Faculty is required to grade and return all assignments within a certain time period

	Course structure Criterion
EL30	Sufficient library resources are made available to the students
EL31	Students are instructed in the proper methods of effective research, including assessment of resource validity
EL32	Before starting the program, students are advised about the program to determine if they have the self-motivation and commitment to learn at a distance
EL33	Learning outcomes for each course are summarized in a clearly written, straightforward statement
EL34	The course structure is effective enough to promote self-study
EL35	Course material is problem centered and promotes study on own pace of learning
	Student Support Criterion
EL36	Students can obtain assistance to help them use electronically accessed data successfully
EL37	Students are provided with hands-on training and information to aid them in securing material through electronic databases, interlibrary loans, and government archives, news services, etc.
EL38	Written information is supplied to the student about the program
EL39	Easily accessible technical assistance is available to all students throughout the duration of the course/program
EL40	A structured system is in place to address student complaints
	Faculty Support Criterion
EL41	Technical assistance in course development is available to faculty and they are encouraged to use it
EL42	There are peer-mentoring resources available to faculty members teaching distance courses
EL43	Distance instructor training continues throughout the progression of the online class
EL44	Faculty members are provided with written resources to deal with issues arising from student use of electronically accessed data
	Evaluation and Assessment Criterion
EL45	The program's educational effectiveness is measured using several methods
EL46	An evaluation process is used to improve the teaching/learning process
EL47	Specific standards are in place to compare and improve learning outcomes
EL48	Data on enrolment, costs, and successful/innovative uses of technology are used to evaluate program effectiveness

	Evaluation and Assessm
EL49	Intended learning outcomes are regularly reviewed to ensure clarity, utility and appropriateness

Table: 7.3 Elearning benchmarks (Adapted from chapters two, three and four).

In the next section the sets of criteria will be integrated to form a framework for benchmarking elearning at TFS.

7.2.4 The Preliminary Framework

The preliminary framework is constructed after the literature study that was undertaken in chapters three, four and five. The framework contains the elements andragogy, elearning pedagogy and considerations related to higher education in South Africa as required by the National Plan. Figure 7.1 provides the preliminary framework for benchmarking elearning at Technikon Free State. The framework presented in figure 7.1 provides an adequate overview of all the constituents of an appropriate framework for the implementation of elearning at an institution of higher learning on the macro level. It also reveals other important processes that are associated with the implementing of elearning. The most important process in this regard is the one of 'instructional design'. Courses that are developed within the andragogical framework, will, to some extent, have to reflect the very essence that is included in the framework, (specifically andragogy and elearning pedagogy). Thus, the framework will not only have to reflect the macro constituents, but also those processes that are accommodated by instructional design. The dynamic relationship between the process of instructional design and the framework is represented in figure 7.1.

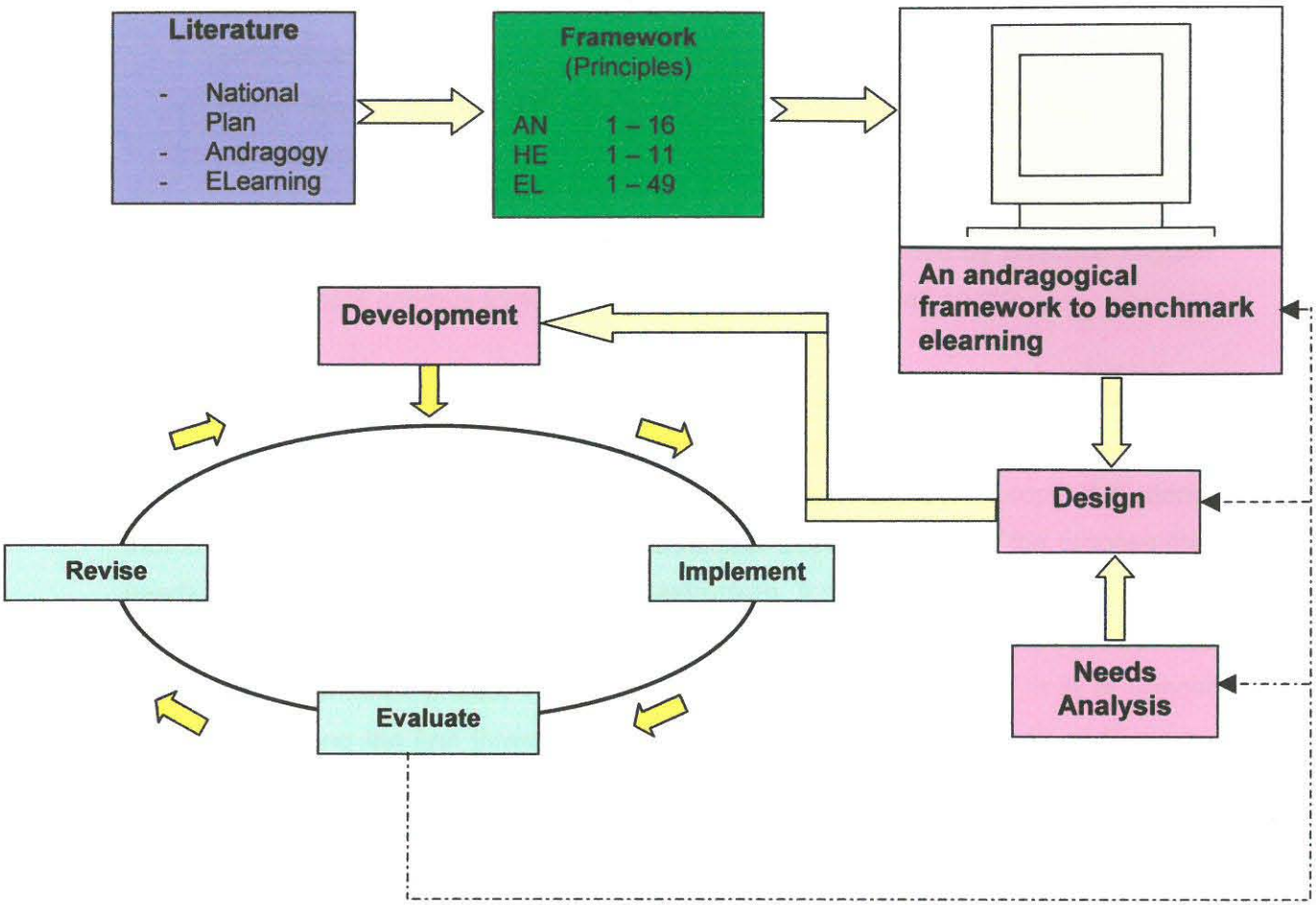

Figure 7.1: The preliminary framework

7.3 TOWARDS A FRAMEWORK FOR TECHNIKON FREE STATE (TFS)

The framework presented in Figure 7.1 is adequate as a generic framework. However, it does not adequately reflect the unique situatedness of TFS. Specifically, a framework for TFS must also account for the vision of TFS, as well as for the institutional knowledge and experiences. Only when these aspects are considered, can a framework for the implementation of elearning be established.

7.3.1 The vision of Technikon Free State

The vision of Technikon Free State is to be one of the leading technology-driven higher education institutions in Southern Africa. The mission is as a responsive institution that exists to:

- Facilitate and enhance ac rs,
- Focus on education that develops people for innovation, leadership and employment, and
- Undertake research that addresses real world issues within regional and national context.

Technikon Free State through collaborative efforts, strengthened by effective support services and a safe campus try to improve the quality of life of all people.

As educational provider, Technikon Free State realising the emerging power of the Internet and to become a technological university of the future introduced elearning in 2000. In doing so, certain technological aspects had to be in place to support students that are both off and on campus. The instructional design process is the process that needs to be followed to build the infrastructure for elearning. The phases of instructional design consist of the needs analysis phase, design phase, development phase, implementation phase, evaluation phase and revision phase. It is of utmost importance during the first three instructional design phases to complete each phase before moving to the next. It is important to note that during these phases the institution does careful research and ensures that all aspects of elearning are considered. Mistakes made are usually very costly, not in terms of money only, but also in terms of time. To rectify such mistakes a complete redesign and restructuring of the whole instructional design process has to be done. The ideal elearning and teaching system is one that is developed from scratch, without any restriction on costs and staff needed.

The needs analysis phase of the framework will bring forth the requirements that have to be in place to coincide with the vision and mission of Technikon Free State. As part of this phase a project plan has to be in place. The needs of the institution have to be assessed. Furthermore, the target market, content has to be analysed, technical analysis done, media tools and authoring selection ensured and structure and organisation of content implemented. The end result will ensure the appropriate development and delivery of courses, training modules and learning materials.

Therefore the end goal of any institution and its instructional offerings is to promote learning.

In the design phase of the framework, literature prescribes the essential elements needed and that are required to design elearning. Sound design principles need to be in place to ensure that efficient learning takes place. These include learning outcomes

lesson design, evaluation design :dia. The design of the framework is based on sound educational principles. These principles are compiled and based on benchmarks from other elearning providers, research conducted and andragogical assumptions about adult learners and their requirements. The framework is further supported and based on elements required by law, namely: The National Education Policy (1996). The design phase and the design of elearning materials must be done properly with the learner and learning as focus. Equally important is that adequate support to learners must be provided, through commitment and having the required resources available.

Before any development of elearning and elearning materials can take place certain design principles have to be present. The development phase of elearning is characterised by authoring and integration of media elements, electronic prototypes testing and ensuring the readiness of courseware for implementation. In ensuring proper development certain design principles have to be in place. These design principles have to be based on sound learning theories. Elearning at Technikon Free State is then developed accordingly to the principles as undertaken in the design phase and by keeping to the vision and mission of the institution. In order to develop elearning it is important to know the most suitable and appropriate instructional strategies, as part of the different approaches to the kind of learners and learning materials. It is important to realise that most learners that are undertaking studies at Technikon Free State on and off campus are adults.

The implementation phase focuses on the distribution, reporting, and tracking and maintenance of elearning as part of the instructional design process. During this phase it is necessary to pilot test elearning beforehand as a preliminary trial, so that mistakes made can be rectified before final implementation. Staff needs to maintain, produce, deliver and need to ensure technical support to the elearning system.

Evaluation of elearning has to be done regularly to ensure quality. A crucial element to consider is whether the needs of the intended students have been met, and if the outcomes of the program inclusive of attitudes, skills and attributes needed by the student, have been successfully reached. Evaluation can be done by means of online test forms, test usability, validation of content and examination results.

Revision of elearning needs to be done in order to keep up with the latest technological developments and educational trends. Learning materials have to be updated to stay in touch with the trends in the business sector. The cycle is then repeated by

implementing the new changes. ...een implementation, evaluation and revision is ongoing, since education and technology is not static in nature. The cycle is repeated as often as needed, to ensure the delivery of quality education to learners. The next section focuses on the actual findings at Technikon Free State that impacts on the revised framework, according to the institutions unique circumstances.

7.3.2 Institutional knowledge and experience

As a distance educational provider Technikon Free State is delivering education to many satellite campuses in close proximity. The Higher Education Policy has placed a ban on delivering education over a distance and therefore the institution had to adopt a new strategic plan. The strategic plan is to use elearning in supporting learners both on and off campus. In my investigation I found that to fully be supportive to learners a much larger staff contingent to design and implement elearning is needed.

As part of the research, a case study was conducted at Technikon Free State. Quantitative and qualitative approaches were employed in the research. As part of the quantitative research a questionnaire was used to ascertain the current state of elearning. The questionnaire also provided an opportunity for participants to view their opinions. As part of the qualitative approach the institution was visited and through observations, interviews, document studies and video materials, the following knowledge and experiences are shared that are incorporated in the revised framework to benchmark elearning at Technikon Free State.

- *Staff Members*. Many staff members are still trapped in old traditional methods of being a transporter of knowledge, instead of a facilitator in the learning process. The learner to staff ratio is also too high as elearning requires virtual office hours. Some staff is overburdened and cannot take on the extra responsibilities of incorporating elearning. Faculty needs to appoint more personnel to assist lecturers. Appointing tutors in handling small problems and an instructional designer per faculty can solve the problem.

- *Technology.* The majority of staff members have not been trained in elearning technologies, or possesses the skills in computers to design or develop elearning materials. The technology at Technikon Free State to deliver is adequate from the institutions, administrative position, as most issues such as student registration, library access, security and control have been centralised. The Technikon Free State currently uses WebCT™ as administrative system in

elearning. Many lecture are unfamiliar with the system and although some lecturers have received training on the system the majority is not on par. The system is not ideally suited, since every institution has unique characteristics. The system is also very costly, as it requires yearly licence fees for registration. It is advisable to rather design one's own system and adjust it to suit the particular needs and wants of the institution. A considerable saving in costs in the long term will be beneficial.

- *Facilities.* Very few facilities existed and lecturers were limited to basic computer programmes on their own computers. Many lecturers are themselves not able to higher level functions on computers, as they only possess basic computer skills. Lecturers need to be trained and empowered to become skilled so that they can train their learners. Learners on campus can only access elearning at the library. Many do not possess the basic skills and many are not computer literate. The computer facilities at the library are also too small for such a large number of students. The ideal is that each faculty should have their own computer centre for students to use. An instructor/administrator of the centre at the faculty can assist lecturers/learners in computer skills and elearning technologies, and to facilitate in technological problems in nature. An instructional designer must be appointed per faculty. The instructional designer can design, train and assist lecturers in the design and development of learning materials for elearning. Elearning at Technikon Free State needs to be decentralised to the faculties, where the design and delivery of educational programming takes place. More freedom to be innovate and to choose their own platforms and applications can take place to suit the faculty's specific needs and preferences. The current centralised system does not support innovativeness.

- *Training.* Staff members and students need to stay in touch with the latest technological advances. The library at Technikon Free State has introduced training programmes to assist first year learners in acquiring basic computer skills. Certain in-service workshops were presented to lecturers in WebCT™ and in courseware design and delivery. These are very important and should be done by the institution itself. Again, many staff still needs urgent support and training in basic computer skills, and more advanced training should succeed this basic training. Staff involved in elearning and its delivery must understand their roles and responsibilities. Incentives can also be given by management for staff doing in-service training or presenting and/or developing

elearning materials. Mar had to adapt to the new policy and changes without the proper training or experience which is desperately needed.

- *Development and Design.* The development of elearning needs to be based on a clear and understandable proposal. A team needs to be appointed to manage the process of developing elearning. Academics at Technikon Free State must pay more attention to the discussion of the process, because basic principles of project management are required for elearning courseware development. The team to develop elearning is too small for an institution such as Technikon Free State. A team should comprise of a project manager, visual designers, programmers, context experts, educators, instructional designers, system staff and system experts. The team can also incorporate experts to assist in the process. Currently there is a centre for elearning with only a project manager, instructional designer and an assistant. The project team needs to be enlarged and its functions expanded and centralised to drive the elearning process. However, decentralisation of the teams' function has to be filtered down to the faculties. The elearning project team also has to ensure proper liaison with the institution's administrative unit. The institution needs to set clear policies. This will contain clear goals and values that will govern all the stakeholders involved in elearning. The behaviour, attitudes, values, needs and responsibilities of all involved in elearning would be accommodated by such a policy. Technikon Free State needs to have a clearer plan and strategy in place.

- *Implementation.* It is the utmost importance that proper monitoring of elearning and elearning programmes take place to ensure quality control. A revised meganism also needs to be in place to improve elearning in totality. The current situation at Technikon Free State is not on par as staff is not trained to apply policies and principles in elearning. A project committee that contain all stakeholders is also not in place to oversee, identify problem areas and monitor the complete elearning process.

- *Andragogy.* Many staff members have not adapted to the higher education scenario. Staff need to move away from traditional approaches in education and must see learners as adults. A learner centred approach is needed instead of a teacher centred approach. Andragogical principles need to be incorporated in elearning and on campus classes. Staff members are not familiar in being facilitators of learning instead of transporters of knowledge or simply are not

interested. Many lectu from fellow colleagues as being incapable of developing or designing elearning materials. There are not enough support structures in place for lecturers.

- *Higher Education Policy.* It is clear that any higher education institution has to implement changes to adjust their own policy to abide by the policy of government. Technikon Free State needs to adjust their policies, as it is not yet functional within the broader policy framework.

- Learners. Many elearners are not able to access the system, as they do not have accessibility, or the finances to purchase a computer. The different cultural backgrounds of students have to be understood as well as their ability to converse in English as medium of instruction. The design and development of learning materials should be done, by keeping cultural diversity into consideration. The financial background and physical availability of facilities are important issues to consider, as many do not possess the basics like electricity and computers.

7.4 THE RECOMMENDED ANDRAGOGICAL FRAMEWORK FOR BENCHMARKING ELEARNING AT TECHNIKON FREE STATE

Although many of the components in the revised framework are similar to the preliminary framework, the focus of the discussion will contain those benchmarks that are changing the preliminary framework.

The following figure shows the recommended andragogical framework. The changes and specific context to construct the framework are discussed. The changes and additions were assembled from the employment of qualitative and quantitative approaches in data gathering during the institutional visits. Figure 7.2 shows how the elements required to benchmark elearning are assembled.

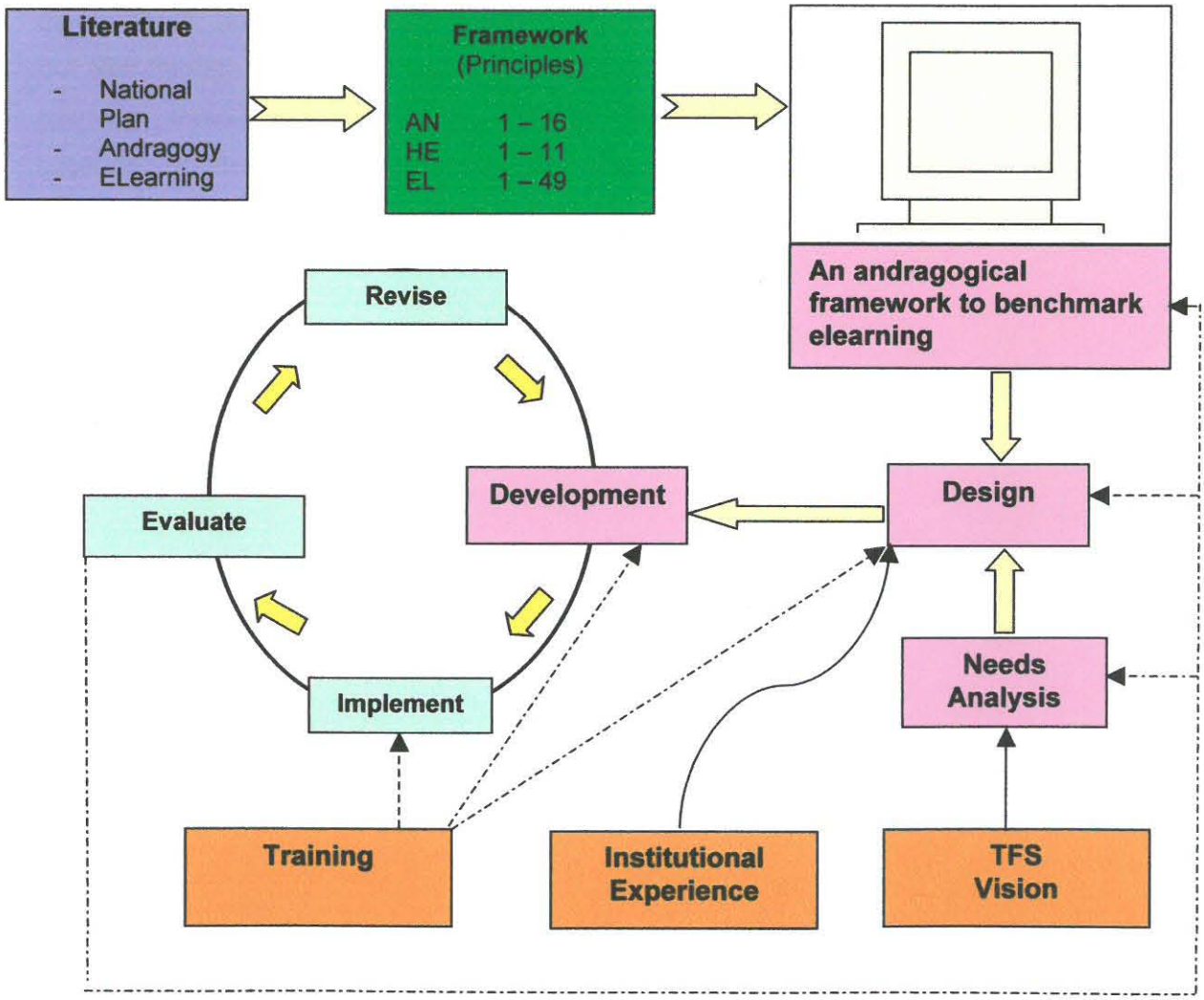

Figure 7.2: The recommended andragogical framework to benchmark elearning at TFS

7.5 SUMMARY

In this chapter, the preliminary framework for elearning was established by using the benchmarks as based on the literature review. Andragogy formed the basis of the framework as elearning is used to support mainly adult learners in higher education but also as a supplementary tool to classroom education. Elearning serves both learners on–campus as well as off campus. The framework also serves and falls within the parameters of what is required by the National Plan for Higher Education in South Africa, as well as the requirements set by national and international providers in the delivery of elearning. The recommended framework culminates in benchmarks as required for implementing and establishing elearning at Technikon Free State. The recommended framework is based on the findings of the field study through interviews, observations, audio- visual data and the study of documents as a qualitative approach, but also through the use of a questionnaire as a quantitative approach in support of the research vehicle, the case study. The recommended framework is therefore the proposed framework to benchmark elearning at Technikon Free State. The next chapter contains an overview of the study, conclusion, shortcomings in the research and recommendations for further research.

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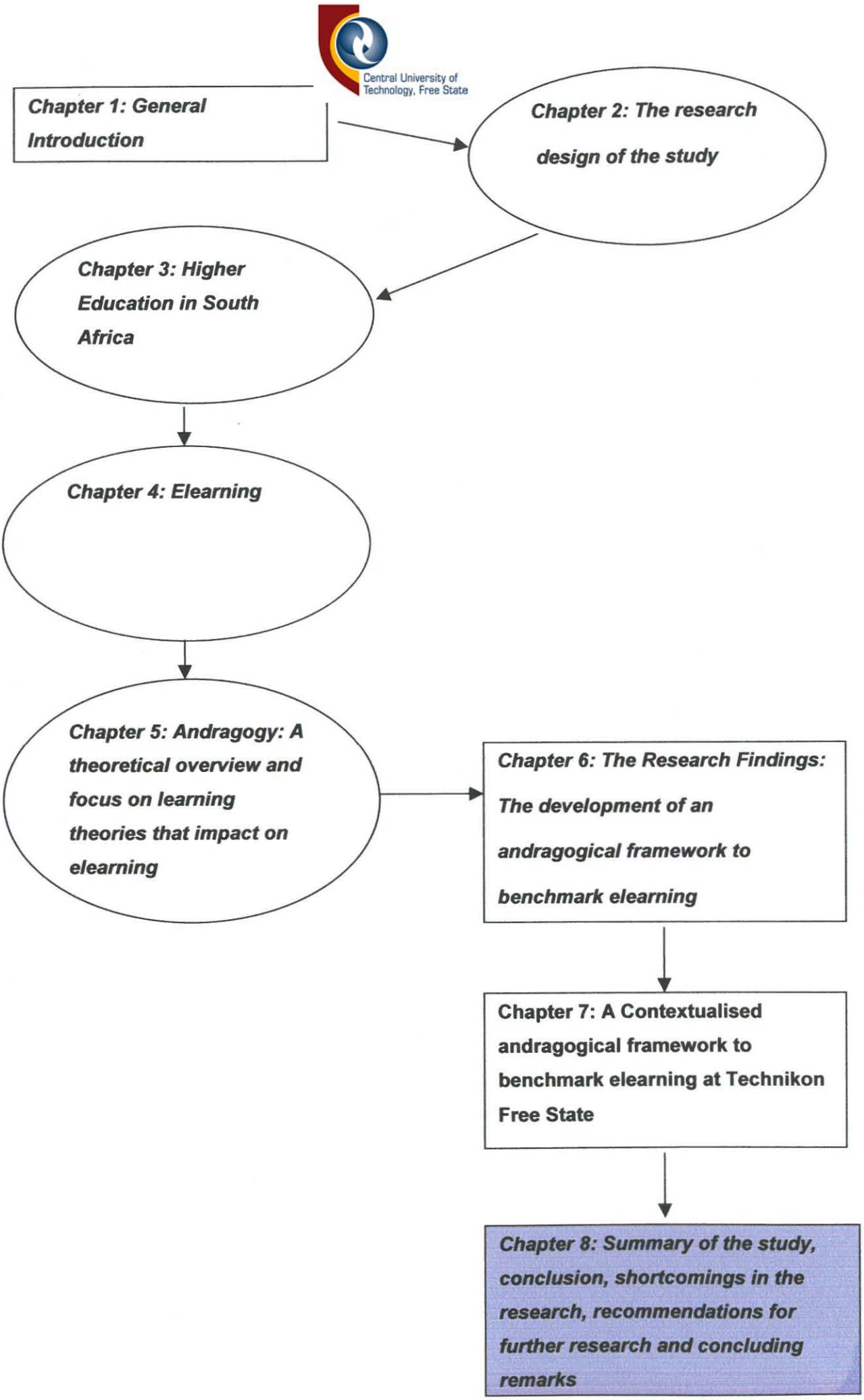
CHAPTER EIGHT



CHAPTER 8: SUMMARY OF CONCLUSION, SHORTCOMINGS IN THE RESEARCH, RECOMMENDATIONS FOR FURTHER RESEARCH AND CONCLUDING REMARKS

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CHAPTER 8

SUMMARY OF THE STUDY, CONCLUSION, SHORTCOMINGS IN THE RESEARCH, RECOMMENDATIONS FOR FURTHER RESEARCH AND CONCLUDING REMARKS

8.1 SUMMARY OF THE STUDY

The aim of the study was to investigate, report and to create a framework for elearning at Technikon Free State. A recommended framework based on andragogical principles was established. The recommended framework could be used and then developed for implementation at Technikon Free State. Lecturers at Technikon Free State as distance education provider, to benchmark elearning could use the framework.

The study started by indicating that the changes in Higher Education in South Africa forced providers of education to rethink their strategies to provide education to the citizens who were previously deprived of higher education. The role and function that elearning can play to eradicate injustices of the past in education, as well as the opportunities it offers to remove barriers to engage in studying, forced institutions to investigate this phenomenon. The changes in the Higher Education system, registration of qualifications at SAQA, the National Qualifications Framework and the new school curriculum (Curriculum 2005), necessitate a move towards learner-centred education.

A detailed account of the research design was given in chapter two. Qualitative and quantitative data collection strategies were used for the case study. The case study is situated in an institutionalised setting, being the introduction of elearning at Technikon Free State.

Chapter three focused on the changes that took place in higher education in South Africa. The emphasis was placed on moving to a more learner-focused approach and reaching certain outcomes as part of the curriculum. Relevant aspects of the new bodies like SAQA, the National Qualifications Framework and the role and changes of higher education were discussed.

The attention of the investigation then shifted in chapter four to elearning as an option to reach learners who are removed from educational institutions as a result of their working commitments, physical and geographical situations, or previous lack of qualifications.

Within this scenario, elearning offers opportunities to replace correspondence courses and previous methods of educational delivery taking place at distance and satellite campuses. The elimination and removal of barriers are accompanied by the openness of electronic education seeing that one can study at one's own pace, place and time. The tools accompanying elearning like e-mail, the Internet, the World Wide Web were discussed to show how effective elearning is. Elearning offers opportunities for asynchronous (delegated) and/or synchronous (live) interactions between learner and lecturer and also interaction between learner and learner. A collaborative effort is made towards the reaching of goals as required for obtaining a qualification.

In the fifth chapter the concept andragogy was offered as a basis for establishing the recommended framework for elearning at Technikon Free State. Andragogy has six assumptions that formed the basis of the framework. They included: The need to know, self-concept of responsibility, amount and diversity of experience, real life applicability, orientation to learning, and internal motivation.

In chapter six the research findings were discussed. The research findings contained the results as obtained through the questionnaire, the remarks made in the questionnaire, observations made at Technikon Free State, interviews and comments from participants and quotes from documents studied at Technikon Free State.

Chapter seven contains the recommended framework for benchmarking elearning at Technikon Free State. The rationale for developing a preliminary framework based on andragogical principles is given to benchmark elearning at Technikon Free State. The core aspects extracted from chapters three, four and five were used in the preliminary framework. This led to a categorisation of the key elements of the mentioned chapters. A final framework emerged after the field study was conducted. These elements were summarised, tabled and coded to form the theoretical framework to benchmark elearning at Technikon Free State and can serve as a guideline for the Technikon Free State.

8.2 CONCLUSION

In chapter one the research question was posed: **Within the context of higher education in South Africa, what framework, underpinned by andragogy, national education policies and elearning theory, will benchmark and support the implementation of elearning at Technikon Free State?**

The literature study confirmed that elearning is a unique and ideal form of delivering education at a distance and especially to adults in acquiring a qualification. From an andragogical perspective as described in the literature, elearning can be considered as an acceptable form of education that is supportive in nature. This form of elearning is also offered as a blended (hybrid) form of learning.

The present situation poses many problems, since finances in the historically disadvantaged communities are a great concern. Elearning centres need to be established with as many institutions as possible. Old and outdated computers can be used to train learners in lower levels.

8.3 SHORTCOMINGS IN THE RESEARCH

The following deficiencies in the research need to be pointed out.

- As elearning was a fairly new phenomenon at Technikon Free State, lecturers were hesitant to participate in the research. Reasons can be that they lack adequate knowledge about the topic and their skills to use computers are limited. They were also hesitant when expressing their true feelings about the real state of elearning and its application at Technikon Free State. Many were positive, but said that more support from management is needed to successfully implement elearning at the Technikon Free State.

- The findings of this study are not generalisable to the wider population of elearners at other institutions. Although it was stated in the research design (chapter two) that the aim of the study was not to generate generalisable findings, it would be valuable to assume that the framework can benefit other institutions in similar settings, especially on how to benchmark elearning.

- All participants in the research were aware of their actions and expressions. Hence, this could have influenced their behaviour towards the researcher and the research conducted, as participants were very wary of their actions and dialogue with the researcher.

- The research was also completed within in a restricted timeframe from May 2001 to May 2003. Few developments in elearning at Technikon Free State took place during this period of research. There were also too many internal movements of staff due to appointments. At that point in time structures and an elearning vision in the newly established elearning department had not been established.

- As few developments have taken place during this time, all staff were not in line with the latest technological developments in designing learning materials. The structures that needed to be in place to develop the elearning vision were not in place. Therefore it was not possible to train and empower staff in elearning as mode of delivery.

- The researcher did not send questionnaires to learners. If this had been done, more information could have been obtained to improve the recommended framework. The learners could have added their perspectives and problems they experienced in elearning at Technikon Free State.

- The application of particular research methods in this research had deficiencies. The questionnaire was sent electronically which could have resulted in lower returns. Many respondents were not always willing to be interviewed or observed, as this could have affected their performance or time schedules. Many participants were hesitant to supply documents as they could be quoted or felt that they could be misquoted.

8.4 RECOMMENDATIONS FOR FURTHER RESEARCH

The following recommendations for further research are based on the perceived shortcomings in literature, as well as from the case study.

- More specific research is required on the andragogical strategies that can be employed to assist learners to overcome learning problems and to open opportunities to learners by using elearning to take education to the learner.

- The design of programmes needs to be investigated to ascertain whether learners at first year level have the skills and knowledge to engage in such programs. The dropout rate of first years is unacceptable.

- Computers can serve learners by acting as a source of knowledge. An investigation can be done how authorities can make computers available for public use and give learners accessibility to the Internet.

- The impact of cultural differences in the experience of elearning needs to be investigated. The impact of culture on the acceptance of elearning is an issue that should be researched in natural settings in especially South African with its diverse population.

8.5 CONCLUDING REMARKS

Elearning holds tremendous potential for all educators and learners. It can act as supportive medium and main deliverer of education to the masses of people in need. It can serve companies with vocational training and eradicate backlogs by providing education in an open, flexible outcomes-based scenario by removing barriers of time, pace and place. A blended form of elearning can serve both learners off and on campus. An important drawback, however, is that academic staff has to be trained and equipped with the latest technologies available. In the words of many lecturers: **"Elearning is for the future. The future in technology is now. Starting tomorrow is too late."**

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SUMMARY OF APPENDICES

The following is a short description of all appendices used in this thesis.

APPENDIX ONE

Appendix one contains the letter that I wrote to Technikon Free State to obtain permission to conduct the research. Included in the letter are all the areas of investigation as well as a promise of anonymity and confidentiality as part of research ethics.

APPENDIX TWO

Appendix two contains the response from Technikon Free State in accepting the request and to grant permission to conduct research.

APPENDIX THREE

The following appendix contains the questionnaire as part of the quantitative research that was conducted at Technikon Free State. The questionnaire was used to ascertain the current state of elearning at TFS. International and national elearning benchmarks from accredited academic institutions were used to assemble the questionnaire. Included in the questionnaire, as part of the benchmarks, are the requirements of the new plan for higher education and the principles embedded in the theory of andragogy.

APPENDIX FOUR

The data collected by means of the questionnaire is contained in appendix four. Data are summarized in table format. The data is presented statistically and contain the count, mode, standard deviation and median of the criteria as measured. The benchmarks for elearning are displayed in conjunction with the abovementioned statistical concepts.

APPENDIX FIVE

Appendix five contains the rough work score sheet where the data were recorded from the questionnaires. To crosscheck findings and data the score sheet were checked by the researcher and his assistant to verify results and to eliminate mistakes.

APPENDIX SIX

This appendix contains an example of the letter that was given to the participants in the research to obtain consent from participants. As agreed the original signed letters will be kept and destroyed by 1 March 2004. The ethical aspects of anonymity and confidentiality are upheld as agreed with participants.

Central University of Technology, Free State

1

APPENDIX ONE

Cell: 082 2024 298

Bayswater
BLOEMFONTEIN
9301

1 March 2001

The Dean
Faculty of Human and Social Sciences
Technikon Free State
Private Bag X 20539
BLOEMFONTEIN
9300

Dear Sir/Madam

REQUEST TO CONDUCT RESEARCH: STUDENT J. BEZUIDENHOUT (20158963)

I am enrolled as a student at the faculty. I am registered for the degree D. Tech. Education and the title for my research is: An andragogical framework to benchmark elearning at Technikon Free State. I am hereby requesting permission to:

- Conduct interviews with management staff, students, support staff and academic staff
- Study documents about elearning at TFS
- Do observations and assess elearning at TFS
- Consult staff about elearning
- Obtain information by handing out questionnaires to all stakeholders in elearning

As researcher I shall adhere to all the ethical aspects of research as required by TFS and keep participants informed in all aspects of the research process.

Trust you find this in order.

Yours faithfully

J.Bezuidenhout
STUDENT

Central University of Technology, Free State

2

APPENDIX TWO

Central University of Technology, Free State

Technikon Vrystaat • Free State • Foreistata

To whom it may concern.

Mr. J Bezuidenhoudt (Student no. 20158963) is a doctoral student of this institution and permission is hereby granted to him to:

- ✓ Conduct interviews on campus concerning E learning aspects;
- ✓ Do observations on E learning activities;
- ✓ Study documents pertaining to his studies.

Dr. EM Sedibe.
Executive Dean: Human Sciences.

15 March 2001

Tegnologiese Universiteit van die toekoms

Technological University of the future

3

APPENDIX THREE

Dear Colleague

SURVEY: BENCHMARKING ELEARNING AT TECHNIKON FREE STATE

As part of the development and ongoing research at the Centre for Elearning and Distance Education, it would be highly appreciated if you can complete the following survey. Information collected will be used to assist and provide staff and learners with quality education as pursued by all educators.

All information that will be collected will be treated as confidential. The survey also ensures the anonymity of all participants. The survey can be completed electronically or in written format. Only one of the two methods in needed but preferably electronically. Both will be made available to you. The survey will take approximately 20 minutes to complete.

Survey's can electronically be send to bezuiden@ananzi.co.za for statistical analysis. Written survey's will be delivered and collected personally by Mr J. Bezuidenhout. The final date for survey's to be completed is 10 September 2002.

Your input and time to complete the survey is highly appreciated.

Yours faithfully

MR J. BEZUIDENHOUT
RESEARCHER

Central University of Technology, Free State

AIM OF THE STUDY

Before you complete the questionnaire read through the following. The focus of this questionnaire is to assist the Technikon Free State, to develop a framework for elearning (web-based) as based on andragogical principles. You have been selected to participate because of your role and function at Technikon Free State.

REVIEW OF LITERATURE

The concerns about the efficiency, appropriateness and delivery of current distance education, in as far as learners are concerned include:

- Low throughput and completion rates, especially in science and technology.
- Inadequate learner support.
- A large number of courses with low student numbers.
- A focus on (less effective, especially at entry levels) correspondence courses.
- Type programmes rather than on multimedia and open learning programmes.
- There is no national quality assurance and quality promotion system.
- Governance problems affect the distance education institutions negatively.
- The failure of the current funding formula to encourage the development of a learner - centered model (NCHE, 2001:1).
- Sophistication of programmes, but in their design based on andragogical principles (Shepherd, 2001:1).

The assumptions underlying the theory of **andragogy** regard adults as:

- Learners with mutual respect, collaboration and influence.
- Learners with an ability to plan mutually.
- Learners who are able to diagnose mutual problems.
- Learners who are able to negotiate mutually and maturely.
- Learners who are self-directed and able to bring own life experiences to class.
- Learners who are problem-centered and manage their own pace of
- Learning (Knowles, 1990:118).

WHAT ELEARNING IS:

"Using various Internet technologies to create, deliver, facilitate, administer and extend lifelong learning"

- Interactive, collaborative and personal.
- Relatively high in development costs; low in delivery costs.
- A blend between "bricks and clicks".
- A different blend for different courses.
- A different blend for different academic levels.

NOTE:

IN THE LIGHT OF THE ABOVE REVIEW OF LITERATURE PLEASE COMPLETE THE FOLLOWING QUESTIONNAIRE.

All questions must be completed. If you are unsure or the question is not applicable mark it accordingly. A Lickert scale will be used to assess the benchmarks identified from the literature. (A Lickert scale is an instrument that asks an individual to respond to a series of statements by indicating whether he or she agrees with each statement)

The Lickert scale lists the 49 benchmarks. You must rank each benchmark on **two** criteria:

CRITERIA A: TO WHAT EXTENT IS THE BENCHMARK TRUE FOR E LEARNING AT THE TECHNIKON FREE STATE?

CRITERIA

1 Completely absent
2 Partially present
3 Present but not adequate
4 Present and satisfactory
5 Completely present and satisfactory
6 Not applicable/Don't know

CRITERIA B: HOW IMPORTANT IS EACH BENCHMARK TO ENSURE QUALITY AT THE TECHNIKON FREE STATE?

CRITERIA

1 Not important at all
2 Not important

3 Unsure
4 Important
5 Very important
6 Not applicable/don't know

Remember to answer all the questions. Provision is also made to voice your own opinion or to give proposals in the space provided. This will assist the Technikon Free State to successfully implement elearning to benefit all students.

PLEASE INDICATE IF YOU ARE PART OF:

1.MANAGEMENT STAFF

☐

2. ACADEMIC STAFF

☐

3.SUPPORT STAFF

☐

THE FOLLOWING NUMBER IS YOUR CONTROL NUMBER. THIS IS JUST TO ASSIST IN COLLECTING THE QUESTIONNAIRES.

MY CONTROL NUMBER IS:

☐

To mark your response (answer) in the questionnaire in the appropriate place use:

A CAPITAL X

The Centre for Elearning appreciates your time and valuable input in the completion of this important research. If you have any problems in any section or any other questions you can contact the following: Mr J. Bezuidenhout (083 2024 298)/Mr J. Badenhorst at Technikon Free State at (051) 507 3322. Remember you only have to complete either the written **or** the electronic version of the questionnaire, not both.

CRITERION A: TO WHAT EXTENT IS THE BENCHMARK **(PRESENT)** FOR ELEARNING AT THE TECHNIKON FREE STATE?	**CRITERION B**: HOW **IMPORTANT** IS EACH BENCHMARK TO ENSURE QUALITY AT THE TECHNIKON FREE STATE?
CRITERIA **1** Completely absent **2** Partially present **3** Present but not adequate **4** Present and satisfactory **5** Completely present and satisfactory **6** Not applicable/Don't know	**CRITERIA** **1** Not important at all **2** Not important **3** Unsure **4** Important **5** Very important **6** Not applicable/Don't know

BENCHMARK	Criteria	1	2	3	4	5	6
Institutional Support							
1. Faculty is provided with professional incentives for innovative practices to encourage development of elearning courses.	A						
	B						
2. There are institutional rewards for the effective teaching of elearning courses.	A						
	B						
3. A documented technology plan is in place to ensure quality standards.	A						
	B						
4. Electronic security measures are in place to ensure the integrity and validity of information.	A						
	B						
5. Support for building and maintaining the elearning infrastructure is addressed by a centralized system.	A						
	B						
6. Inter-institutional dependence is strived for by the institution	A						
	B						
7. Trust in partners in inter-institutional agreements are important for success	A						
	B						
8. Inter-institutional collaboration is needed to ensure marketability and sustainability	A						
	B						
Remarks:							

Course Development

		1	2	3	4	5	6
9. Elearning course development must be approved through a broad peer review process	A						
	B						
10. Guidelines exist regarding minimum standards for course development, design and delivery.	A						
	B						
11. Course design is managed by teams comprised of faculty, content experts, instructional designers, technical experts, and evaluation personnel.	A						
	B						
12. During course development, the various learning styles of students are considered.	A						
	B						
13. Assessment instruments are used to ascertain the specific learning styles of students, which then determine the type of course delivery.	A						
	B						
14.Courses are designed with a consistent structure, easily discernable to students of varying learning styles.	A						
	B						
15.The technology being used to deliver course content is based on learning outcomes.	A						
	B						
16.Instructional materials are reviewed periodically to ensure they meet program standards.	A						
	B						

Remarks:

		1	2	3	4	5	6
Teaching/Learning Process							
17. Student interaction with faculty is facilitated through a variety of ways.	A						
	B						

18. Feedback to student assignmer s provided in a timely manner.	A							
	B							
19. Courses are separated into self-contained segments (modules) that can be used to assess student mastery before moving forward in the course or program.	A							
	B							
20. The modules/segments are of varying lengths as determined by the complexity of learning outcomes.	A							
	B							
21. Each module/segment requires students to engage themselves in analysis, synthesis, and evaluation as part of their course assignments.	A							
	B							
22. Class voice-mail and/or E-mail systems are provided to encourage students to work with each other and their instructor(s).	A							
	B							
23. Courses are designed to require students to work in groups utilizing problem-solving activities in order to develop topic understanding.	A							
	B							
24. Course materials promote collaboration among students.	A							
	B							
25. Teaching/learning paradigm is learner-centered/flexible and lifelong learning is incorporated in the teaching/learning paradigm	A							
	B							
26. Different learning styles subject-centered objectives centered, experience centered and opportunity centered are utilized to increase learning	A							
	B							
Remarks								
Course structure								
27. Students are provided with supplemented course information that outlines course objectives, concepts, and ideas.	A							
	B							
28. Specific expectations are set for students with respect to a minimum amount of time per week for study and homework assignments.	A							
	B							
29.Faculty is required to grade and return all assignments within a certain time period.	A							
	B							
30. Sufficient library resources are made available to the students.	A							
	B							
31. Students are instructed in the proper methods of effective research, including assessment of resource validity.	A							
	B							

32. Before starting the program, stu about the program to determine if they have the self-motivation and commitment to learn at a distance.	A						
	B						
33. Learning outcomes for each course are summarized in a clearly written, straightforward statement.	A						
	B						
34. The course structure is effective enough to promote self-study	A						
	B						
35. Course material is problem centered and promotes study on own pace of learning	A						
	B						
Remarks							

		1	2	3	4	5	6
Student Support							
36. Students can obtain assistance to help them use electronically accessed data successfully.	A						
	B						
37. Students are provided with hands-on training and information to aid them in securing material through electronic databases, interlibrary loans, and government archives, news services, etc.	A						
	B						
38. Written information is supplied to the student about the program.	A						
	B						
39. Easily accessible technical assistance is available to all students throughout the duration of the course/program.	A						
	B						
40. A structured system is in place to address student complaints.	A						
	B						
Remarks:							
Faculty Support							
41. Technical assistance in course development is available to faculty and they are encouraged to use it.	A						
	B						
42. There are peer-mentoring resources available to faculty members teaching distance courses.	A						
	B						

43. Elearning instructor training cor the progression of the online class.	A						
	B						
44. Faculty members are provided with written resources to deal with issues arising from student use of electronically accessed data.	A						
	B						
Remarks:							
Evaluation and Assessment							
		1	2	3	4	5	6
45. The program's educational effectiveness is measured using several methods.	A						
	B						
46. An evaluation process is used to improve the teaching/learning process.	A						
	B						
47. Specific standards are in place to compare and improve learning outcomes.	A						
	B						
48. Data on enrolment, costs, and successful/innovative uses of technology (all) are used to evaluate program effectiveness.	A						
	B						
49. Intended learning outcomes are regularly reviewed to ensure clarity, utility and appropriateness.	A						
	B						

THE TECHNIKON FREE STATE APPRECIATES YOUR TIME AND VALUABLE INPUT IN COMPLETING THIS IMPORTANT SURVEY. ELECTRONIC VERSIONS CAN BE E – MAILED TO: bezuiden@ananzi.co.za OR WILL BE COLLECTED PERSONALLY.

REGARDS

MR J.BEZUIDENHOUT

RESEARCHER

Central University of Technology, Free State

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APPENDIX FOUR

Central University of Technology, Free State

All Survey Results		Count	Average	St.Dev.	Mode	Median
Institutional Support						
1. Faculty is provided with professional incentives for innovative practices to encourage development of elearning courses.	A	25	1.7	1.2	1	1
	B	25	4.2	1.1	4	4
2. There are institutional rewards for the effective teaching of elearning courses.	A	25	1.2	0.9	1	1
	B	25	3.9	1.5	5	4
3. A documented technology plan is in place to ensure quality standards.	A	25	1.8	1.4	1	2
	B	25	4.1	1.4	5	5
4. Electronic security measures are in place to ensure the integrity and validity of information.	A	25	3.0	1.4	3	3
	B	25	4.0	1.9	5	5
5. Support for building and maintaining the distance education infrastructure is addressed by a centralized system.	A	25	2.7	1.3	2	3
	B	25	4.0	1.7	5	5
6. Inter-institutional dependence is strived for by the institution	A	25	1.6	1.6	1	1
	B	25	3.2	1.7	4	4
7. Trust in partners in inter-institutional agreements are important for success	A	25	1.2	1.2	0	1
	B	25	4.2	1.4	5	5
8. Inter-institutional collaboration is needed to ensure marketability and sustainability	A	25	1.9	1.2	3	2
	B	25	4.0	1.4	5	4
Course Development						
9. Elearning course development must be approved through a broad peer review process	A	25	1.8	1.3	2	2
	B	25	4.3	1.1	5	5
10. Guidelines exist regarding minimum standards for course development, design and delivery.	A	25	2.4	1.7	4	3
	B	25	4.6	1.1	5	5
11. Course design is managed by teams comprised of faculty, content experts, instructional designers, technical experts, and evaluation personnel.	A	25	2.0	1.6	1	1
	B	25	4.5	1.0	5	5
12. During course development, the various learning styles of students are considered.	A	25	1.9	1.2	2	2
	B	25	3.9	1.3	5	4
13. Assessment instruments are used to ascertain the specific learning styles of students, which then determine the type of course delivery.	A	25	1.6	1.3	1	1
	B	25	3.7	1.5	5	4
14.Courses are designed with a consistent structure, easily discernable to students of varying learning styles.	A	25	1.9	1.4	2	2
	B	25	4.2	1.0	4	4
15.The technology being used to deliver course content is based on learning outcomes.	A	25	2.2	1.5	4	2
	B	25	3.7	1.8	5	4
16.Instructional materials are reviewed periodically to ensure they meet program standards.	A	25	2.3	1.6	4	2
	B	25	4.4	1.1	5	5
Teaching/Learning Process						
17.Student interaction with faculty is facilitated through a variety of ways.	A	25	2.0	1.4	2	2
	B	25	3.8	1.6	5	4
18.Feedback to students is provided in a manner that is constructive and non - threatening	A	25	2.9	1.7	3	3
	B	25	4.5	0.7	5	5
19.Courses are separated into self-contained segments (modules) that can be used to assess student mastery before moving forward in the course or program.	A	25	2.4	1.6	2	2
	B	25	4.4	0.6	4	4
20.The modules/segments are of varying lengths as determined by the complexity of learning outcomes.	A	25	2.6	1.9	0	3
	B	25	4.2	1.1	5	4
21.Each module/segment requires students to engage themselves in analysis, synthesis, and evaluation as part of their course assignments.	A	25	2.8	1.5	4	3
	B	25	4.2	1.1	5	4
22. Class voice-mail and/or E-mail systems are provided to encourage students to work with each other and their instructor(s).	A	25	1.4	1.0	1	1
	B	25	3.7	1.8	5	4
23 Courses are designed to require students to work in groups utilizing problem-solving activities in order to develop topic understanding.	A	25	2.0	1.3	2	2
	B	25	4.1	1.1	4	4
24. Course materials promote collaboration among students.	A	25	2.2	1.5	2	2
	B	25	4.2	1.1	5	5
25. Teaching/learning paradigm is learner-centered/flexible and lifelong learning is incorporated in the teaching/learning paradigm	A	25	2.4	1.5	2	2
	B	25	4.3	0.9	5	5
26. Different learning styles subject-centered objectives centered, experience centered and opportunity centered are utilized to increase learning	A	25	2.1	1.4	2	2
	B	25	3.8	1.2	5	4

27. Students are provided with supplemented course infor outlines course objectives, concepts, and ideas.		25	2.9	1.4	4	3
		25	4.4	1.1	5	5
28. Specific expectations are set for students with respect to a minimum amount of time per week for study and homework assignments.	A	25	2.3	1.6	3	3
	B	25	4.0	1.4	5	4
29.Faculty is required to grade and return all assignments within a certain time period.	A	25	2.4	1.9	4	3
	B	25	4.1	1.4	5	5
30.Sufficient library resources are made available to the students.	A	25	2.9	1.8	4	4
	B	25	4.6	0.8	5	5
31. Students are instructed in the proper methods of effective research, including assessment of resource validity.	A	25	2.2	1.6	3	2
	B	25	4.5	0.8	5	5
32. Before starting the program, students are advised about the program to determine if they have the self-motivation and commitment to learn at a distance.	A	25	1.8	1.4	3	2
	B	25	3.6	1.8	5	4
33. Learning outcomes for each course are summarized in a clearly written, straightforward statement.	A	25	2.8	1.6	4	3
	B	25	4.3	1.4	5	5
34. The course structure is effective enough to promote self-study	A	25	2.7	1.7	4	3
	B	25	4.4	1.1	5	5
35. Course material is problem centered and promotes study on own pace of learning	A	25	2.6	1.7	3	3
	B	25	4.4	1.1	5	5
Student Support						
36. Students can obtain assistance to help them use electronically accessed data successfully.	A	25	2.6	1.3	3	3
	B	25	4.4	1.0	5	5
37. Students are provided with hands-on training and information to aid them in securing material through electronic databases, interlibrary loans, and government archives, news services, etc.	A	25	1.9	1.5	1	2
	B	25	4.6	0.8	5	5
38. Written information is supplied to the student about the program.	A	25	2.6	1.8	4	4
	B	25	4.0	1.6	5	5
39. Easily accessible technical assistance is available to all students throughout the duration of the course/program.	A	25	2.0	1.6	1	2
	B	25	3.9	1.6	4	4
40. A structured system is in place to address student complaints.	A	25	1.8	1.6	2	2
	B	25	4.2	1.3	5	5
Faculty Support						
41. Technical assistance in course development is available to faculty and they are encouraged to use it.	A	25	3.0	1.4	4	3
	B	25	4.5	1.0	5	5
42. There are peer-mentoring resources available to faculty members teaching distance courses.	A	25	2.1	1.5	2	2
	B	25	4.0	1.1	4	4
43. Elearning instructor training continues throughout the progression of the online class.	A	25	1.8	1.5	0	2
	B	25	4.0	1.1	4	4
44. Faculty members are provided with written resources to deal with issues arising from student use of electronically accessed data.	A	25	1.6	1.4	1	1
	B	25	3.8	1.6	5	4
Evaluation and Assessment						
45. The program's educational effectiveness is measured using several methods.	A	25	2.4	1.6	2	2
	B	25	3.9	1.4	4	4
46. An evaluation process is used to improve the teaching/learning process.	A	25	2.6	1.6	4	3
	B	25	4.0	1.3	4	4
47. Specific standards are in place to compare and improve learning outcomes.	A	25	2.4	1.4	3	3
	B	25	4.2	1.4	5	5
48. Data on enrolment, costs, and successful/innovative uses of technology are used to evaluate program effectiveness.	A	25	2.0	1.7	1	2
	B	25	3.7	1.5	5	4
49. Intended learning outcomes are regularly reviewed to ensure clarity, utility and appropriateness.	A	25	2.4	1.6	4	3
	B	25	4.2	1.4	5	5
	Total	25	3.2	1.4	4	3.4

Central University of Technology, Free State

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APPENDIX FIVE

APPENDIX FIVE

SURVEY TECHNIKON FREE STATE

BENCHMARKING E - LEARNING

Central University of Technology, Free State

RESPONDENTS RESPONDENTS RESPONDENTS

CONT.NO	3	6	11	13	16	20	25	35	50	53	58	59	69	71	72	82	83	86	X	Y	Z	40	36	42	55						
QUES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		COUNT	AVE	ST.DEV.	MODE	MEDIAN
1A	1	2	3	4	1	1	2	3	4	0	3	3	1	0	1	1	2	1	2	4	1	1	1	0	1		25	1.7	1.2	1.0	1.0
1B	4	5	5	4	4	4	3	5	0	4	4	5	5	4	5	4	4	5	4	4	5	5	4	3	5		25	4.2	1.1	4.0	4.0
2A	1	1	1	1	1	1	2	1	3	4	1	0	1	0	1	1	1	1	2	3	1	1	1	0	1		25	1.2	0.9	1.0	1.0
2B	4	5	5	5	4	2	3	4	0	5	4	0	5	3	5	4	5	5	5	4	5	5	3	3	4		25	3.9	1.5	5.0	4.0
3A	0	4	3	2	3	1	2	0	0	1	2	2	1	0	2	3	3	1	1	3	1	3	0	5	1		25	1.8	1.4	1.0	2.0
3B	5	5	5	4	4	5	4	3	3	5	5	5	5	4	4	5	4	5	4	0	5	4	0	5	5		25	4.1	1.4	5.0	5.0
4A	4	3	3	3	4	2	4	0	4	4	4	3	3	0	3	4	0	3	1	3	3	3	5	5	4		25	3.0	1.4	3.0	3.0
4B	5	5	5	5	5	5	3	3	0	5	5	5	5	5	5	5	0	5	4	0	5	0	5	5	5		25	4.0	1.9	5.0	5.0
5A	2	5	3	4	3	3	3	3	4	4	2	2	2	4	2	3	3	2	1	0	2	4	0	5	2		25	2.7	1.3	2.0	3.0
5B	4	5	5	5	4	5	3	3	0	5	5	5	5	3	5	5	4	5	5	0	5	5	0	5	5		25	4.0	1.7	5.0	5.0
6A	1	5	1	2	0	1	3	0	4	0	2	3	1	0	0	3	3	1	2	0	1	1	0	5	2		25	1.6	1.6	1.0	1.0
6B	5	5	4	4	3	4	3	3	0	0	4	5	3	2	0	4	4	3	4	5	3	3	0	5	5		25	3.2	1.7	4.0	4.0
7A	1	2	1	3	1	1	3	0	0	2	2	2	0	0	0	2	2	0	2	0	0	1	0	4	2		25	1.2	1.2	0.0	1.0
7B	5	5	4	5	4	5	5	3	4	5	5	5	4	4	0	5	5	4	3	5	4	5	0	5	5		25	4.2	1.4	5.0	5.0
8A	1	2	0	3	2	1	3	1	4	2	2	3	3	0	1	2	2	3	3	0	3	1	0	3	2		25	1.9	1.2	3.0	2.0
8B	5	5	4	5	3	5	5	4	0	5	4	5	4	4	3	4	5	4	4	5	4	4	0	5	5		25	4.0	1.4	5.0	4.0
9A	2	2	1	3	4	1	3	1	0	0	1	3	2	0	1	3	2	2	2	0	2	5	0	3	2		25	1.8	1.3	2.0	2.0
9B	5	5	5	4	4	4	3	4	4	0	5	5	5	4	4	3	4	5	4	5	5	5	5	5	5		25	4.3	1.1	5.0	5.0
10A	1	4	2	4	2	3	3	1	0	5	1	3	4	0	1	3	2	4	1	0	4	5	0	4	4		25	2.4	1.7	4.0	3.0
10B	5	5	5	5	5	5	3	4	4	5	5	5	5	5	5	5	4	5	4	0	5	5	5	5	5		25	4.6	1.1	5.0	5.0
11A	1	1	2	3	1	4	2	1	4	1	1	2	1	0	1	1	1	1	2	0	1	5	2	5	6		25	2.0	1.6	1.0	1.0
11B	5	5	5	5	4	5	5	4	0	5	4	5	4	5	5	5	5	4	5	5	4	5	5	5	4		25	4.5	1.0	5.0	5.0
12A	3	2	1	2	2	4	3	1	3	2	4	3	2	0	1	2	1	2	1	4	2	2	0	0	0		25	1.9	1.2	2.0	2.0
12B	5	5	3	5	2	5	5	2	0	3	4	5	4	4	4	4	5	4	5	5	4	4	4	5	2		25	3.9	1.3	5.0	4.0
13A	2	1	1	1	0	4	4	2	3	3	4	2	1	0	1	3	1	1	2	0	1	2	0	0	0		25	1.6	1.3	1.0	1.0
13B	5	5	3	4	0	5	4	2	0	5	5	5	4	2	4	3	5	4	4	5	4	4	3	5	2		25	3.7	1.5	5.0	4.0

14A	3	2	2	3	0	4	4	1	0	2	4	2	2	0	1	2	2	2										25	1.9	1.4	2.0	2.0
14B	5	5	5	5	0	5	4	4	4	4	4	5	4	4	4	4	5	4										25	4.2	1.0	4.0	4.0
15A	4	3	1	4	2	3	4	2	3	4	4	2	2	0	2	4	1	2										25	2.2	1.5	4.0	2.0
15B	5	5	5	5	4	4	4	4	0	5	5	5	5	2	4	4	4	5	4	0	4	0	0	5	4			25	3.7	1.8	5.0	4.0
16A	2	3	1	2	1	4	4	2	0	4	4	3	4	0	1	4	2	4	2	0	4	3	0	0	4			25	2.3	1.6	4.0	2.0
16B	5	5	5	5	4	5	4	4	3	5	4	5	5	5	5	4	4	5	4	5	5	5	0	5	4			25	4.4	1.1	5.0	5.0
17A	3	2	1	1	0	4	3	3	2	0	4	2	2	0	2	2	2	2	1	5	2	3	0	0	4			25	2.0	1.4	2.0	2.0
17B	5	5	4	4	3	4	3	2	0	0	4	5	4	5	5	5	4	4	5	5	4	5	0	5	4			25	3.8	1.6	5.0	4.0
18A	3	3	2	4	0	4	4	4	0	3	5	3	3	0	3	4	3	3	3	5	3	5	0	0	5			25	2.9	1.7	3.0	3.0
18B	5	5	5	5	3	5	4	4	3	5	5	5	4	5	5	4	4	4	4	5	4	5	5	5	5			25	4.5	0.7	5.0	5.0
19A	4	2	4	3	2	3	4	1	0	5	4	2	2	0	2	1	2	2	2	4	2	5	0	0	5			25	2.4	1.6	2.0	2.0
19B	5	4	4	5	5	4	4	5	3	5	5	5	4	4	3	4	4	4	4	5	4	5	5	5	4			25	4.4	0.6	4.0	4.0
20A	4	4	3	4	0	3	4	0	0	4	5	2	2	0	5	1	2	3	3	5	2	5	0	0	5			25	2.6	1.9	0.0	3.0
20B	5	5	4	5	3	4	4	0	3	5	5	5	4	4	5	4	4	4	4	5	4	5	5	5	4			25	4.2	1.1	5.0	4.0
21A	4	3	0	4	2	3	4	2	3	4	4	2	3	0	5	4	3	3	3	4	3	4	0	0	4			25	2.8	1.5	4.0	3.0
21B	5	4	3	5	4	5	4	5	0	5	4	5	4	5	5	4	4	4	4	5	4	5	3	5	4			25	4.2	1.1	5.0	4.0
22A	2	2	2	1	1	1	2	2	2	2	4	1	1	0	1	3	3	1	2	0	1	1	0	0	0			25	1.4	1.0	1.0	1.0
22B	5	4	3	4	4	5	4	5	0	5	5	5	5	5	4	4	4	5	3	0	5	4	0	5	0			25	3.7	1.8	5.0	4.0
23A	2	2	3	2	0	4	3	2	0	2	5	2	2	0	1	2	2	2	2	3	2	3	0	0	4			25	2.0	1.3	2.0	2.0
23B	5	5	5	4	3	5	4	5	3	5	5	5	4	4	4	3	4	4	4	5	4	4	0	5	4			25	4.1	1.1	4.0	4.0
24A	3	3	2	2	0	4	4	3	0	3	5	2	2	0	1	2	1	2	3	3	2	4	0	0	4			25	2.2	1.5	2.0	2.0
24B	5	5	5	5	3	5	4	5	5	5	5	5	4	3	4	3	4	4	4	5	4	5	0	5	4			25	4.2	1.1	5.0	5.0
25A	3	2	2	2	0	2	4	1	0	5	5	2	2	0	2	3	2	2	4	4	2	3	2	0	5			25	2.4	1.5	2.0	2.0
25B	5	5	5	4	3	5	4	5	2	5	5	5	4	3	5	3	4	3	5	5	4	5	3	5	5			25	4.3	0.9	5.0	5.0
26A	3	2	0	1	0	3	4	2	3	2	5	2	2	0	1	3	2	2	2	4	2	3	0	0	4			25	2.1	1.4	2.0	2.0
26B	5	5	3	5	3	5	4	5	0	4	5	5	3	3	2	3	4	3	4	5	3	5	3	5	4			25	3.8	1.2	5.0	4.0
27A	2	3	3	2	0	4	4	4	5	4	4	2	3	0	3	4	3	3	3	4	3	2	4	0	4			25	2.9	1.4	4.0	3.0
27B	5	5	3	5	3	5	4	5	0	5	4	5	5	4	4	5	4	5	4	5	5	5	5	5	4			25	4.4	1.1	5.0	5.0
28A	3	1	3	2	0	4	4	1	4	5	3	2	3	0	1	4	1	3	4	0	3	3	0	0	4			25	2.3	1.6	3.0	3.0
28B	5	4	3	5	3	5	4	5	0	5	4	5	5	4	2	4	4	4	4	0	5	5	5	5	4			25	4.0	1.4	5.0	4.0
29A	4	3	5	3	0	4	4	1	5	3	4	2	0	0	1	4	2	0	3	4	0	4	0	0	5			25	2.4	1.9	4.0	3.0
29B	5	5	5	5	3	5	4	3	0	5	5	5	3	5	1	4	4	3	4	5	3	5	5	5	5			25	4.1	1.4	5.0	5.0
30A	3	3	5	2	0	4	5	4	0	2	4	3	4	0	1	3	4	4	4	5	4	4	0	0	5			25	2.9	1.8	4.0	4.0
30B	5	5	5	5	3	5	5	4	5	5	5	5	5	5	2	5	4	5	4	5	5	5	3	5	5			25	4.6	0.8	5.0	5.0
31A	1	3	3	3	0	5	4	2	0	1	4	2	2	0	1	3	1	2	3	4	2	5	0	0	4			25	2.2	1.6	3.0	2.0
31B	5	5	5	4	3	5	5	5	5	5	5	5	5	4	4	4	4	5	4	5	5	2	4	5	4			25	4.5	0.8	5.0	5.0
32A	2	1	3	1	0	4	3	1	3	3	4	2	3	0	1	1	1	3	4	0	3	2	0	0	0			25	1.8	1.4	3.0	2.0

32B	5	5	5	5	3	4	4	5	0	5	4	5	4	3	1	5	4	4									25	3.6	1.8	5.0	4.0
33A	4	3	2	2	0	4	4	3	5	4	5	2	3	0	3	4	2	4									25	2.8	1.6	4.0	3.0
33B	5	5	3	5	3	5	5	5	0	5	5	5	5	5	5	4	4	5									25	4.3	1.4	5.0	5.0
34A	4	2	3	3	0	4	5	3	0	4	5	2	3	0	5	3	2	4	4	0	4	3	0	0	4		25	2.7	1.7	4.0	3.0
34B	5	5	3	5	3	4	5	5	5	5	5	5	5	5	5	4	4	4	4	0	5	5	5	5	4		25	4.4	1.1	5.0	5.0
35A	3	2	2	2	0	4	4	2	0	5	5	3	3	0	5	2	2	3	4	5	3	3	0	0	4		25	2.6	1.7	3.0	3.0
35B	5	5	5	5	3	4	5	5	5	5	5	5	4	5	5	4	4	4	4	5	4	5	0	5	4		25	4.4	1.1	5.0	5.0
36A	3	3	1	2	2	4	5	1	3	3	4	2	3	0	1	2	2	3	3	4	3	3	4	0	4		25	2.6	1.3	3.0	3.0
36B	5	5	5	5	4	4	5	5	0	5	5	5	4	5	4	4	4	4	5	5	4	5	4	5	4		25	4.4	1.0	5.0	5.0
37A	3	2	2	1	0	3	4	1	0	4	4	2	1	0	1	1	2	1	2	0	1	4	4	0	4		25	1.9	1.5	1.0	2.0
37B	5	5	5	4	3	5	5	5	5	5	4	5	5	5	2	4	4	5	5	5	5	5	4	5	4		25	4.6	0.8	5.0	5.0
38A	4	4	3	1	0	4	5	4	4	4	4	2	4	0	1	2	2	4	4	0	4	4	0	0	0		25	2.6	1.8	4.0	4.0
38B	5	5	4	5	3	5	5	5	0	5	4	5	5	4	3	4	4	5	4	0	5	5	4	5	0		25	4.0	1.6	5.0	5.0
39A	4	4	2	1	0	2	5	3	5	4	3	2	1	0	1	1	2	1	2	0	1	4	3	0	0		25	2.0	1.6	1.0	2.0
39B	5	5	5	4	3	4	5	5	0	5	4	5	4	4	4	5	4	4	4	0	4	5	4	5	0		25	3.9	1.6	4.0	4.0
40A	2	2	4	1	0	4	5	1	0	4	2	2	1	0	1	3	2	1	2	0	1	4	0	0	4		25	1.8	1.6	2.0	2.0
40B	5	5	4	5	3	4	5	5	3	5	5	5	5	4	1	4	4	5	4	0	5	5	5	5	4		25	4.2	1.3	5.0	5.0
41A	4	3	2	4	4	4	5	1	4	4	3	3	2	0	2	4	3	2	2	4	2	4	3	0	5		25	3.0	1.4	4.0	3.0
41B	5	5	5	5	4	4	5	5	0	5	5	5	5	4	5	4	4	5	4	5	5	5	4	5	5		25	4.5	1.0	5.0	5.0
42A	2	3	4	2	1	3	3	1	0	5	2	2	2	0	1	4	2	2	2	0	2	4	0	0	5		25	2.1	1.5	2.0	2.0
42B	5	5	4	4	4	4	4	5	3	5	4	5	3	4	5	4	4	3	4	0	3	5	4	5	5		25	4.0	1.1	4.0	4.0
43A	3	3	3	3	0	0	2	3	0	0	4	2	1	0	3	4	2	1	2	0	1	2	0	0	5		25	1.8	1.5	0.0	2.0
43B	5	5	3	5	3	4	3	5	3	3	4	5	4	4	4	4	4	4	4	0	4	5	4	5	5		25	4.0	1.1	4.0	4.0
44A	1	1	3	1	0	3	2	1	0	3	4	2	1	0	2	3	1	1	3	0	1	3	0	0	5		25	1.6	1.4	1.0	1.0
44B	5	5	3	4	3	4	4	5	4	3	5	5	5	0	4	4	4	5	4	0	5	0	4	5	5		25	3.8	1.6	5.0	4.0
45A	2	2	2	1	0	4	4	2	0	4	4	2	3	0	5	3	2	3	4	0	3	3	1	0	5		25	2.4	1.6	2.0	2.0
45B	5	5	3	5	3	4	4	5	3	5	4	5	4	4	5	4	4	4	4	0	4	0	4	5	5		25	3.9	1.4	4.0	4.0
46A	3	3	4	1	0	4	4	1	4	4	3	3	3	0	5	4	2	3	2	0	3	4	0	0	4		25	2.6	1.6	4.0	3.0
46B	5	5	4	5	3	4	4	5	0	5	4	5	4	5	5	4	4	4	4	0	4	5	4	5	4		25	4.0	1.3	4.0	4.0
47A	3	2	4	3	0	4	2	1	5	3	3	3	3	0	3	3	2	3	2	0	3	4	1	0	4		25	2.4	1.4	3.0	3.0
47B	5	5	4	4	3	4	4	5	0	5	5	5	5	5	4	4	4	5	4	0	5	5	4	5	5		25	4.2	1.4	5.0	5.0
48A	3	1	2	1	0	4	2	0	5	3	3	2	1	0	6	2	2	1	3	0	1	4	1	0	4		25	2.0	1.7	1.0	2.0
48B	5	5	3	5	3	5	4	3	0	5	5	5	3	3	3	4	4	3	4	0	3	5	2	5	5		25	3.7	1.5	5.0	4.0
49A	3	3	3	1	0	4	4	1	4	4	4	2	4	0	1	3	2	4	3	0	4	2	0	0	5		25	2.4	1.6	4.0	3.0
49B	5	5	3	5	3	5	4	5	0	5	5	5	5	4	4	4	4	5	4	0	5	5	4	5	5		25	4.2	1.4	5.0	5.0
																											25	3.16	1.4	3.6	3.4

Central University of Technology, Free State

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APPENDIX SIX

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I, _____ hereby volunteer to participate in research conducted at Technikon Free State. In signing this consent form, I agree to volunteer in the research project being conducted by Johan Bezuidenhout (20158963) between (1 April 2001 and 1 October 2003) with the title **an andragogical framework to benchmark e – learning at Technikon Free State.** Research includes interviews, observations, and availing documents pertaining to the study and assisting the researcher with technological data available.

I understand that the research being conducted relates to the experiences of doctoral students that contribute to attrition and doctoral persistence. I understand that excerpts from my written transcripts and tape-recorded verbal communications with the researcher will be studied and may be quoted (only with my approval) in a doctoral dissertation and in future papers, journal articles and books that will be written by the researcher.

I grant authorisation for the use of the above information with the full understanding that my anonymity and confidentiality will be preserved at all times. I understand that my full name or other identifying information will never be disclosed or referenced in any way in any written or verbal context. I understand that transcripts, both paper and floppy disk versions, will be secured in the privacy of the researcher's home office and that any audio tapes of my conversations with the researcher will be erased no later than (1 March 2004).

I understand that my participation is entirely voluntary and that I may withdraw my permission to participate in this study without explanation at any point up to and including, the last day of (date).

_____
Signature

Date: 15 March 2001